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ABSTRACT

Guidelines for designing, implementing, and conducting occupational exploration programs for grades 7-9 are contained in this document, which was developed for use with public schools in North Carolina. Discussion covers the philosophy of occupational exploration, mission statement, continuing objectives for grades 7-9, program description of occupational exploration, program scope, exploratory laboratory description and sequencing, staff size and scheduling, facilities, equipment, teaching materials and supplies, information on the Career Exploration Clubs of America, strategies for implementing an occupational exploration program, recommended personal characteristics and competencies of staff, and guidelines for teacher certification and program evaluation. Appendixes, which make up the greater portion of the document, are intended to aid local units in designing inservice programs, arranging various laboratories for exploratory programs, purchasing equipment, selecting supplies and teaching materials, and developing instructional material. Each laboratory is described outlining some possible occupational cluster combinations. Equipment and materials lists are provided to assist in purchasing those most appropriate for exploratory experiences. Each laboratory has an instructional prototype for individualizing instruction. The appendixes are titled as follows: Proposal for Inservice Education, Business and Office Occupations, Environmental Occupations, Service Occupations, Occupational Information Center, and General Information. (TA)

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A GUIDE
FOR DESIGNING AND IMPLEMENTING
A MIDDLE GRADES
OCCUPATIONAL EXPLORATION PROGRAM

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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Foreword

This publication has been developed to serve as a guide in designing, implementing, and conducting an occupational exploration program. Comprehensive occupational exploration as it now operates in North Carolina began on a pilot basis in January 1970. After observing and evaluating these programs since that time, the Middle Grades Exploration staff feels the recommendations and suggestions in this guide are sound and that exploratory programs should attempt to follow the direction outlined, in so far as resources permit. Although the local education agency has the flexibility to design and conduct programs that will meet the needs of students within the unit, the overall purpose and objectives of occupational exploration should be similar throughout the state. Hopefully, this publication will assist as new programs are initiated and on-going ones modified.

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MIDDLE GRADES OCCUPATIONAL EXPLORATION PROGRAMS FOR THE
PUBLIC SCHOOLS OF NORTH CAROLINA

Philosophy

Occupational exploration is a part of a sequential educational process in the continuum from awareness to occupational proficiency. It is an essential and integral part of the total development of an individual. The importance of exploration is emphasized by the needs of the individual which can be met through productive employment and the needs of society for the production and distribution of goods and services.

Every student while in elementary and junior high school, as a normal part of his educational process, should be seriously involved in activities and/or programs designed to help him develop a greater awareness of the knowledges and skills required for living, learning and working, expand his occupational horizons, develop positive attitudes and appropriate work habits, explore the world of work, and provide information on which he can act as he considers possible career choices. The relationships between reading and employment, arithmetic and income, writing and self-respect should be made clear through the efforts of teachers as they correlate between areas of exploration, occupational information and academic subjects. The program should contribute to the development of wholesome avocational and leisure time activities, to aesthetic development, and to effective citizenship. The student should become a better interpreter of technology and a more discriminatory consumer. Thus exploration programs serve both general and occupational education purposes.

Students generally need a greater understanding of the world of work, experiences that develop cognitive, affective, and psychomotor skills, opportunities to explore their capabilities and potentials along with experiences that build self-confidence. Hopefully students will be motivated to reach their educational objectives.

Awareness and exploration programs and activities are steps in the educational process leading eventually to successful pursuit of a career pattern. Activities should be designed to develop awareness and to expand occupational horizons. Occupational emphasis is essential to a balanced exploration program in the middle and junior high school range.

Mission Statement

The mission of occupational exploration for students in grades 7-9 is to provide experiences which are occupational in nature, represent typical job tasks, include concepts representative of the world of work, and assist the student in self appraisal.

Continuing Objectives for Grades 7-9

1. Students will appraise their individual interests, abilities, potentials, desires and needs.
2. Students will develop positive self-concepts, positive attitudes toward work, and social skills necessary for effective human relationships.
3. Students will recognize the dignity of each occupation and appreciate the contributions which each make to our functioning society.
4. Students will explore employment trends and the nature of work in the widest possible range of careers as related to their personal interest, abilities, needs and desires.
5. Students will explore, participate in, and achieve success in basic skills related to a variety of careers.
6. Students will develop an understanding of how products and services are designed, manufactured, distributed and/or utilized in the United States.
7. Students will practice creativity, initiative and decision-making in solving problems relative to career planning, satisfaction of personal and family responsibilities, and effective community living.
8. Students will make choices as they formulate educational plans for their future in line with employment possibilities and appraisal of personal potentials and limitations.
9. Students will develop attitudes and skills related to the appropriate use of leisure time.

Program Description of Occupational Exploration

Occupational exploration is charged with the responsibility of providing students with exploratory learning activities and information that will enable them to wisely prepare for making a living. It is a student-centered, activity-oriented learning experience designed to equip the student with a relevant, meaningful education.

As an educational program it has a unique, separate identity with its own goals, objectives, content, strategies and activities. As such, it has three basic aspects. Occupational information, student self-appraisal, and exploratory learning activities related to the fifteen occupational clusters are the basic concerns of occupational exploration. Participation in exploration clubs is also an important element in this aspect of the program.

Next, occupational exploration is designed, through a cooperative educational effort in conjunction with other disciplines, to provide a total and comprehensive approach to learning. Correlation of learning activities and teaching methods, along with cooperative planning by occupational and academic teachers of learning activity packages characterize this phase of exploration. In this aspect, it is more of a "blend" of all disciplines.

Lastly, occupational exploration should strive to infuse occupational information into the total school curriculum through the utilization of work-related teaching examples and the incorporation of occupational facts into the teaching materials of such subjects as language arts, social studies, math, and science. This contributes to an awareness by students that all knowledge is related to living. In this aspect, occupational education loses its distinctiveness, but not its effectiveness.

Regardless of the approach, the final organization of the program will vary with each local administrative agency according to personnel, leadership, facilities, and commitment to quality education. State level consultants are available to assist in the development and implementation of an effective program.

A comprehensive approach will require the use of qualified teachers, a variety of instructional materials, adequate facilities, equipment and supplies. Community support and resources will be essential. Two things must be kept in mind - (A) Experiences in all fifteen clusters and occupational information and student self-appraisal are essential. (B) These experiences must be "exploratory."

Laboratory activities are essential for any well-organized, meaningful exploration program. A program not including such activities is considered incomplete. Careful planning is required for each activity, with the interests and needs of students always receiving foremost consideration in the process.

Students must be properly prepared prior to participating in each laboratory activity and must also be provided with meaningful follow-up experiences. Activity for "activity sake" is highly undesirable and cannot be justified in an exploratory program.

A legitimate occupational exploration experience can be identified when one or more affirmative responses are derived when the following criteria are applied:

1. The activity simulates the performance of a typical job task which allows students to see the relationship between the activity and the job requirement;
2. The activity simulates the skills that may be developed in high school occupational offerings or at the post secondary level;
3. The activity provides occupational information which allows students to understand field and level relationships (Career Ladder Concept) concerning occupational clusters; and
4. The activity provides an opportunity for students to appraise themselves in relation to job requirements and to present and future educational opportunities.

Any activity not meeting one of the above criteria is highly questionable and should be replaced by one more appropriate.

The person(s) responsible for planning and implementing a program must consider these factors, especially the assignment of teaching responsibilities in these cluster areas. Of utmost importance will be the knowledge and competencies of the individual teachers, rather than their formal training or particular teaching area. Therefore, suggested personnel would include any teacher and/or para-professional knowledgeable in the particular cluster area. However, it must be remembered that if 50% of a teacher's schedule is in a certain area, he or she must be certified in that area (see certification, page 20). Providing instruction in these cluster areas can be most effectively achieved through a cooperative effort by all teachers in the school.

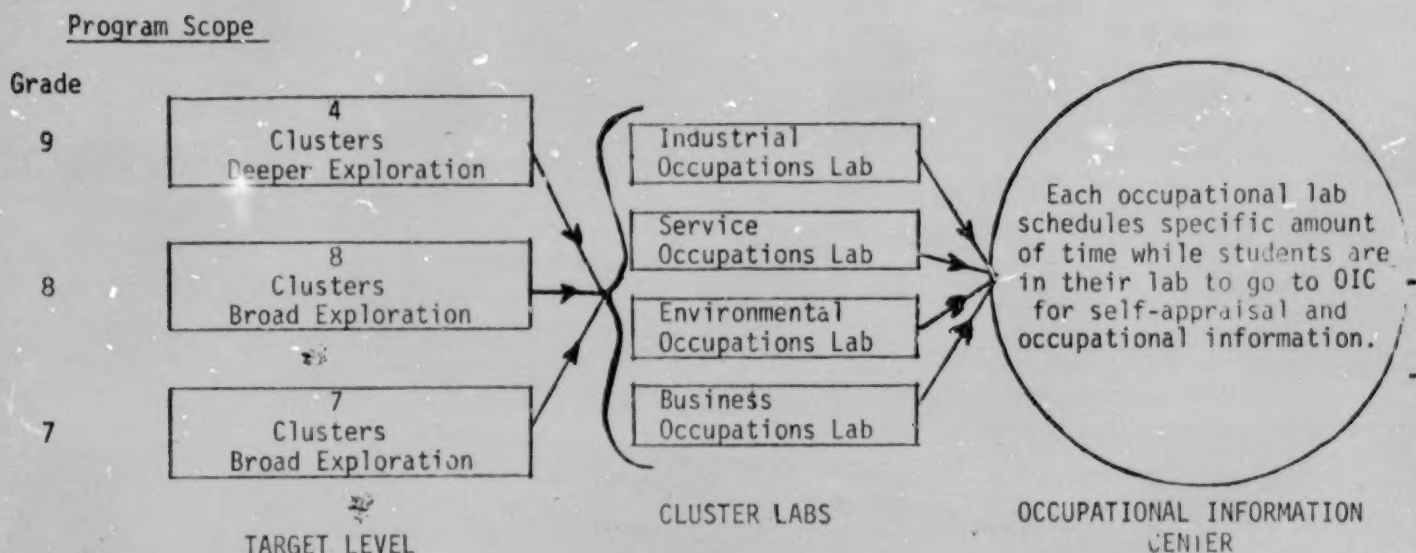
Along with understanding the nature of occupational exploration, it is necessary to realize that in career education the term, "career," refers to the broad connotation of the "career of living." In occupational exploration the emphasis is placed on helping students understand and prepare for that aspect of living including the world of work.

The organization of occupational exploration is based on "fifteen occupational clusters" (defined as a collection, group, or family of occupations for classification purposes). These cluster areas include:

1. Agri-Business and Natural Resources
2. Environmental Control
3. Marine Science
4. Business and Office
5. Communications and Media
6. Marketing and Distribution
7. Construction
8. Manufacturing
9. Transportation
10. Fine Arts and Humanities
11. Public Service
12. Personal Service
13. Consumer and Homemaking
14. Health
15. Hospitality and Recreation

Occupational information and student self-appraisal, along with exploratory activities further characterize this occupational exploration component.

Occupational exploration can be organized in several ways. Experience has shown that perhaps the best way would be to offer exploratory experiences in seven of the fifteen clusters at the seventh grade level and the other eight at the eighth grade, with students selecting those clusters of greatest interest at the ninth grade. Another approach offers a broad range (all 15) of the cluster offerings at the seventh grade level and a narrowing down of offering at the eighth and ninth grades, based on the interests of the students.



The target grade levels for an occupational program are grades 7-9 as indicated by the illustration above. The Cluster concept is the base for exploration. Note that 15 clusters are covered in the grades 7 and 8. Activities at these two levels should provide broad exploration. At the ninth grade students select 4 clusters of their individual interest.

Four laboratories provide the setting for students to engage in activities that simulate jobs in the world of work (see illustration). The decision as to which clusters are to be explored in these labs at the seventh and eighth grades is up to the local education agency.

An integral part of occupational exploration is the Occupational Information Center (above illustration). Notice that the Occupational Information Center is separate, but yet supportive of the other 4 labs. The OIC serves to assist in occupational information, self-analysis, individual and group guidance, etc. All exploratory lab teachers should schedule a specified amount of time for all students to work within the Occupational Information Center during the period in which they are in each laboratory.

Exploratory Lab Description and Sequencing

There are five exploratory labs in the comprehensive career exploration program. These labs are for: Business Occupations; Environmental Occupations; Industrial Occupations; Service Occupations; and the Occupational Information Center. Each should be large enough to accommodate 16-20 students with 4 to 5 work stations in which 4 to 5 students will work. Equipment, materials, and activities conducted in these labs should be considered on the basis of these four criteria:

1. The activity simulates the performance of a typical job task which allows students to see the relationship between activity and the job requirement.
2. The activity simulates the skills that may be developed in high school occupational offerings or at the post secondary level.
3. The activity provides occupational information which allows students to understand field and level relationships (Career Ladder Concept) concerning occupational clusters.
4. The activity provides an opportunity for students to appraise themselves in relation to job requirements and to present and future educational opportunities.

Below are listed the laboratories and the clusters generally explored within the labs.

Business Occupations Exploratory Lab

Clusters: Business and Office, Distribution & Marketing,
Communications and Media

Environmental Occupations Exploratory Lab

Clusters: Agri-Business and Natural Resources,
Environmental Control, Marine Science,
Hospitality and Recreation

Industrial Occupations Exploratory Lab

Clusters: Manufacturing, Construction
Transportation, Fine Arts

Service Occupations Exploratory Lab

Clusters: Consumer and Homemaking, Health Occupations,
Personal Service, Public Service,
Hospitality and Recreation

Occupational Information Center

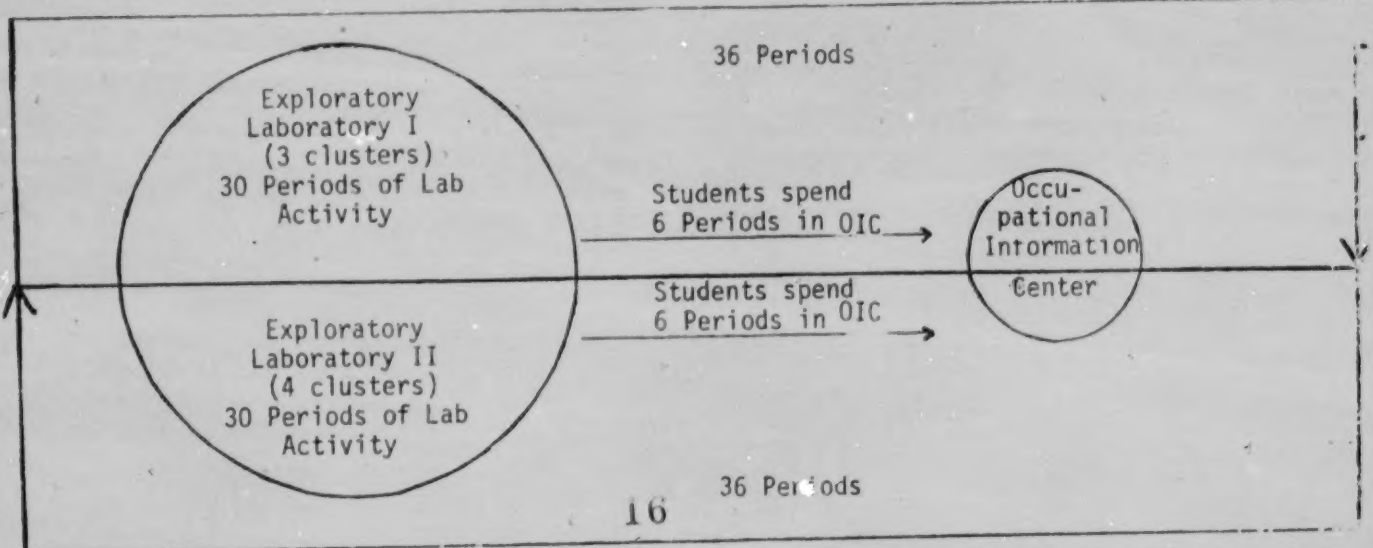
Occupational Information, Self-Appraisal, Individual & Group Guidance

The following discussion and illustration is an example of how the fifteen clusters might be explored during the seventh and eighth grades. The ninth grade affords the student an opportunity to further his interest in exploration.

Please note that the labs and clusters chosen for exploration at the seventh and eighth grades is an example. A LEA may wish to choose a different schedule of the labs at these two levels.

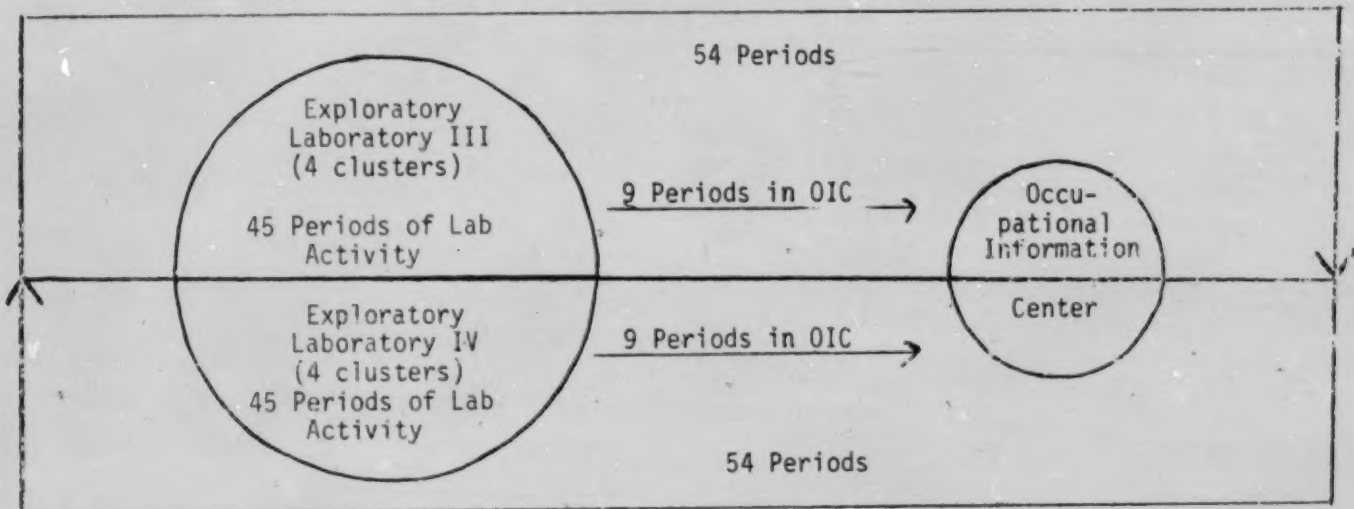
SEVENTH GRADE

Seventh graders spend 72 periods in the exploratory program. Thirty-six (36) periods are spent in each of two laboratories exploring seven occupational clusters. At the end of 36 periods, students rotate to the second laboratory. Students should be scheduled in the Occupational Information Center at least six periods or the equivalent during each laboratory cycle. (The center should be used at those times most appropriate for students.) The diagram below illustrates the rotation.



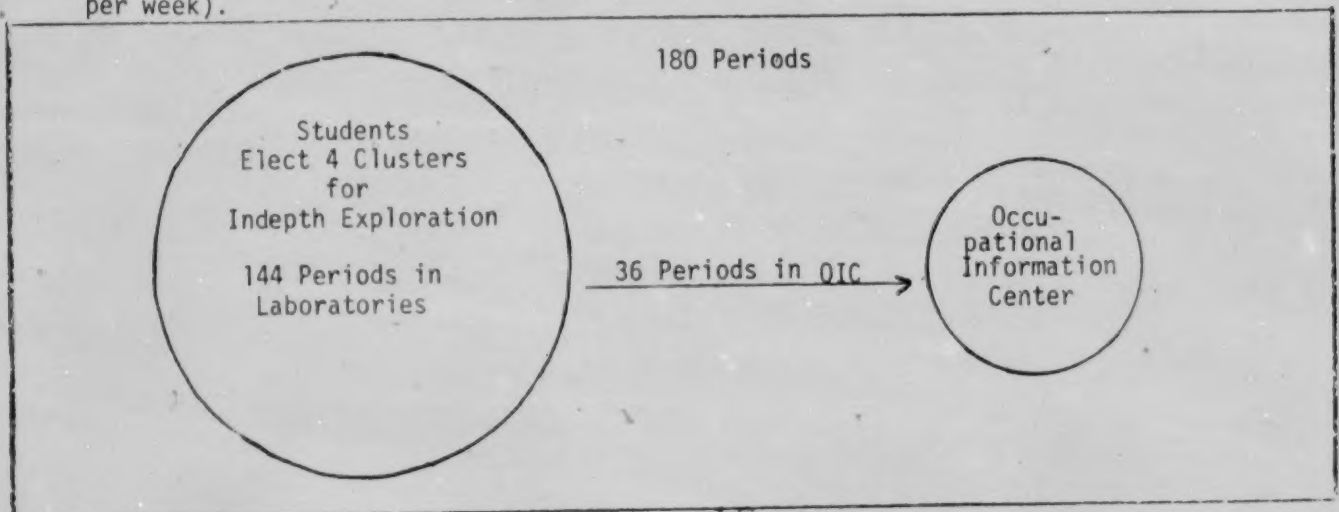
EIGHTH GRADE

At the eighth grade level, students spend 108 periods in the program. Fifty-four (54) periods are spent in each of two laboratories exploring the eight clusters not covered in the seventh grade. At the end of 54 periods, students rotate to the other laboratory. At least 9 periods or the equivalent during each laboratory cycle should be scheduled for activities in the Occupational Information Center. The following diagram illustrates the rotation.



NINTH GRADE

Ninth graders elect the four clusters of greatest interest and spend 180 periods exploring in greater depth. Thirty-six (36) periods or the equivalent during the year should be scheduled for activities in the Occupational Information Center (one period per week).



An alternative approach would be to offer exploratory experiences in all fifteen clusters at the seventh grade level. At the eighth grade level students could choose at least eight of the fifteen clusters for further exploration. Ninth graders could elect the four clusters of greatest interest for in-depth experiences.

Scheduling for a comprehensive exploration program depends on the number of personnel, available facilities, enrollment, etc. It is suggested that a block of students be scheduled into the total program and the team of occupational education teachers then organize the students into appropriate exploratory laboratories. The suggested periods per week, per year for scheduling are as follows:

Two periods per week at the seventh grade level

Three periods per week at the eighth grade level

Five periods per week at the ninth grade level

Due to the nature of exploratory activities and the fact that most are individualized to a great extent, 16-20 students per class is recommended.

STAFF SIZE AND SCHEDULING

In the planning of exploratory experiences for students grades 7-9, several factors must be reconciled. Although this is not a complete list, the following must be considered:

1. Student body size by grade and grades to be included
2. Number of periods per day
3. Period length (45 or 55 minutes)
4. Serve all students to at least minimum recommendation
5. A common planning period be provided for each exploratory teacher

When data is gathered and decisions are reached, it is then possible to determine staff and facility needs.

FACILITIES

It should be obvious at this point that there are many variables to be considered in planning the exploratory labs. The number of teachers and labs to be used must be adjusted according to student body size, etc. Consideration must also be given to lab sizes if existing facilities are to be used.

Despite the many variables that exist from LEA to LEA and based on the "average situation," it appears that a good typical program would be organized to include five teachers and five separate laboratories. Each lab should have 5-8 different work or activity areas to accommodate up to four students each. Four of the five laboratories should be designed for occupational cluster activities while the fifth is designed for career information and student self-appraisal. As noted elsewhere, the cluster approach is the focal point for this program and each lab should be designed to meet student needs based on the final determination locally as to which teacher will have primary responsibility for each of the career clusters.

Many LEA's have achieved great success in structuring labs from standard size classrooms while others have eliminated partitions to assure ample space.

EQUIPMENT

One of the factors of this program which makes it somewhat different from the "regular" occupational programs is the fact that the equipment required for a specific lab does not call for "20 - 16 ounce claw hammers" or "30 standard keyboard, manual typewriters." While this program will require from 3 to 6 of the above mentioned, it is not essential and not desirable to have such quantities of these kinds of equipment. Rather, it is essential to have a few of each of a large number of different items of associated or related equipment. These items are placed in specific "work stations" or housed in regular tool storage areas until need arises. There should always be a sufficient number and variety of tools and equipment so that each student can be productively engaged. Where occasionally large expensive pieces of equipment such as a \$700 to \$800 cash register might be highly desirable, it might also be too expensive in terms of available resources. A used or less expensive model available for \$75 to \$200 could serve the same purpose if judiciously selected. Generally, all equipment purchase decisions should be based on "need/use" criteria, i.e., What do you need to implement the program? How will this be used in implementing the cluster approach? Because of the high level of "dynamics" that should exist in each lab, there is a need to utilize every piece of equipment and every inch of space; therefore, unused equipment or "dust collectors" should be promptly disposed of and replaced with high motivation items..

TEACHING MATERIALS AND SUPPLIES

Each lab will require an assortment of teaching materials and a relatively large quantity of expendable supplies. All labs will use varied media, some continuously, some regularly. The Occupational Information Center will need a large assortment on a relatively full time basis. The teaching materials needed will include such things as career games, catalogues, newspapers and an assortment of others.

Teaching supplies (expendables) are an absolute requisite and the need will be continuous. A program that meets all other criteria but lacks the essential expendable supplies will prove to be totally dysfunctional. Teachers should be encouraged at all times to do the best with what they have; but if students are to profit from the program, there must be ample and varied supplies.

Career Exploration Clubs of America (CECA)

Career clubs are an integral part of the total program of occupational exploration. In general, they provide an opportunity for the student to be with friends, to identify with a specific field of interest, to gain recognition from his peers, teachers, and other adults, to be of service, and to gain a sense of identification.

Some of the contributions of a career exploration club include --

- (1) The student gains a variety of firsthand experience through consistent contact with personnel working in a specific occupational area.
- (2) The student learns if he is qualified and interested in obtaining the necessary education and experience to enter his chosen field.
- (3) The student is apprised of the opportunities available in a specific occupation to an occupational education graduate.
- (4) The student gains experiences in leadership roles as a member of his youth organization.
- (5) The student gains an awareness of the professional organizations which exist to help him in his career choice, and in attaining his career goals.

Career Exploration Clubs of America supply the vehicle for relating occupational competence and significance to the student's work environment and his role in society. Such clubs also provide a laboratory for securing experience not possible through the other aspects of the curriculum.

Strategies for Implementing a Program of Occupational Exploration

Local Interest

Local administrators interested in investigating the possibility of beginning a program of exploration should begin by reviewing the literature and the research findings concerning programs of this nature. Professional magazines, such as the American Vocational Journal, and the Educational Research Information Center (ERIC system) are excellent sources which describe a multitude of programs.

Visit Successful Programs in North Carolina

North Carolina has approximately 75 administrative units with exploratory programs. It is recommended that the interested administrator visit several successful programs. The State staff will assist in scheduling such visitation if contacted.

DETERMINE NEED FOR LOCAL PROGRAM

After reading about and visiting successful exploratory programs, administrators must determine whether there exists a need for such a program in their units. Once the decision is made to initiate the program, all persons concerned must become involved in the planning process if the most meaningful experiences are to be provided for students.

Plan and Describe the Instructional Program

Experience has proved that the most successful programs are those which were implemented only after careful planning. The purpose must be clearly stated;

the continuing objectives easily understood; and the specific objectives measurable if a valid evaluation is to be made.

Various approaches can be made in planning a program. It is recommended, however, that a planning team, composed of an administrator, the principal, and teachers be organized. Parents and community leaders might also make a contribution in planning. This team should study the exploratory needs of students and develop an instructional program geared to meet these needs. Area Directors of Occupational Education should be called upon for advice during the planning process.

In designing the program, all aspects of the program should be planned including the teachers needed (number and type), facilities, equipment, materials and supplies, the scope and sequencing of clusters, the utilization of community resources, and pre-service and in-service preparation for teachers.

Orient Faculty and Administrators

Once the plan has been developed, it is essential that the entire faculty, along with the principal and members of the central office staff, be brought together for a full explanation and discussion of what is to be accomplished. There must be total commitment from all concerned if the program is to succeed.

Orient Parents and Others in School Community

It is not enough for school personnel alone to have a commitment to a program. If occupational exploration is to be successful, parents and the school community must understand and support the concept.

A public meeting designed to fully explain the program prior to its beginning is one means of developing an understanding and support for the approach. The community can make a significant contribution to such a program; however, before such support will be forthcoming, it is imperative that good public relations be in operation.

Support for Program

Occupational education by its very nature has traditionally cost money. Exploration also requires adequate financing to operate effectively. The extent of cost depends on the comprehensiveness of the program, the number of personnel

needed, the facilities, equipment, materials, and supplies which must be provided. Housing, teachers and equipment alone are not sufficient for good programs. There must be adequate funds available for materials and expendable supplies.

Currently, there are four ways in which exploratory programs are financed in North Carolina.

1. Sixty-seven units have specially-funded projects with monies coming from the state to support the programs. These dollars are limited and it is doubtful that much if any expansion can be expected from these funds.

2. Several units have assigned personnel from the regular occupational man month allotment to work in exploratory programs. State Board of Education policy permits man months to be used for exploratory programs; however, they must not be used in grades lower than the seventh. This is one possibility for a local unit to secure personnel. Regular occupational equipment and material dollars may also be used for exploratory programs just as for other occupational areas.

3. A few administrative units have used locally paid teachers to conduct exploratory programs and this possibility should not be overlooked.

4. In a few instances, regular ADM teachers are used to provide an occupational exploration program. There is an abundance of talent in all school faculties. Local administrators should survey the talents. This could be done on a limited basis in almost every school in North Carolina.

Pre-Service and In-Service Education

For any program to be successful, adequate teacher preparation is essential. No program of occupational exploration should be attempted before all personnel involved have satisfactorily completed the necessary preparation. In Appendix A is a pre-service or in-service form which should provide guidance to local units in their staff development efforts.

Orientation Session for Students

It was recommended earlier that parents be oriented to occupational exploration before beginning a program. It is equally important that students know the nature of the program prior to their participation. In many schools the students are the best salesmen for exploratory activities, which indicates their responsiveness to new ideas.

Evaluate and Modify Programs

When the program becomes operational, evaluation should become an integral part of the process. The evaluation should be built around program objectives. If objectives are not being met but still seem appropriate, new strategies must be developed which do meet the objectives. An occupational exploration program should, therefore, be one of constant experimentation, evaluation, and modification to better meet continuing and specific objectives.

Recommended Personal Characteristics, Competencies (Professional & Subject Matter)
For Every Occupational Exploration Teacher

How important is the occupational exploration teacher and what are some desirable characteristics of an effective teacher? Study after study has confirmed the importance of the student-teacher relationship in the learning process. One such work, Clinical Supervision, by Robert Goldhammer, emphatically suggests that, "it is the relationship that teaches rather than the text." Goldhammer further states that the teacher's emotional capacities, cognitive styling, philosophy of life, personal values, and relationship to himself directly affect his teaching essence.

With this in mind, the following PERSONAL characteristics would seem appropriate and desirable for occupational exploration teachers.

A Teacher Must:

- A. Think well of himself and others
- B. Possess a unified and integrated personality that will enable him to get along well with others and maintain effective communication
- C. Maintain and live human values, thereby through example, encourage students to develop appropriate values for themselves
- D. Be receptive to experience and ideas and be able to allow his students to be open and inquisitive
- E. Possess competencies that will result in constructive learning experiences
- F. Be spontaneous, responsive, and "permissive" with his students
- G. Through concentration on the needs, problems and feelings of students, enjoy his teaching efforts
- H. Have a sympathetic, tolerant understanding of weaknesses in others
- I. Treat situations factually
- J. Be able to use the English language effectively
- K. Have a constructive professional attitude and a genuine interest in and respect for teaching
- L. Endeavor to improve his teaching competence since he is basically a learner
- M. Command the professional respect of his colleagues
- N. Recognize the dignity and worth of each individual

Professional Competencies

A Teacher Should Have:

- A. Experience in a wide variety of teaching methods and techniques and materials
- b. A working knowledge of related fields
- C. Had, within the last three years, summer school experience or other forms of pre and/or in-service preparation in occupational exploration
- D. Experience in professional organizations
- E. The ability to plan and guide worthwhile exploration experiences
- F. The foresight to provide opportunities for students to correlate, analyze, and synthesize ideas and materials and to explore wide and varied data
- G. The know-how to encourage students to participate in exploratory experiences which will promote the development of original expressions and creativity
- H. The ability to work as a member of an interdisciplinary team

Subject Matter Competencies

A Teacher Should Have:

- A. The ability to identify and effectively utilize occupational information available from various sources
- B. An understanding and can identify fifteen occupational clusters, identify entry-level jobs in each cluster area, and identify the job skills required for each job
- C. The educational background necessary to describe the hierarchy of jobs in each occupational cluster and identify educational and/or skill requirements for each level
- D. The ability to recognize and can utilize benefits to be derived from community resources
- E. An understanding of the basic principles of our economics and their relationship to occupational endeavors and can relate these to appropriate student activities
- F. First-hand knowledge of the world of work
- G. The knowledge of appraisal instruments that will assist students in appraising personal potential and motivate them to explore capabilities in diversified areas of their occupational interest
- H. The know-how to organize learning centers for individuals and groups of students to explore career interests

- I. An understanding of the occupational exploration's role in designing and implementing instructional experiences through which students may compare interest and aptitudes with work requirements in a variety of occupations
- J. The competence to synthesize data based on social, economic, political, and technological conditions as they affect labor market trends over the next ten years

Teacher Certification

Until such time as regular college courses are designed to adequately prepare teachers specifically for teaching in exploratory programs, the following method will be used for certification. Anyone holding a regular North Carolina Teacher's Certificate Class A or G and who attends one state-sponsored exploration workshop and one local state-approved workshop will be issued a Vocational Certificate in occupational exploration. Several colleges and universities have expressed interest in developing courses for training exploratory teachers. When these are operational, consideration will be given to establishing new criteria for certification. In the interim, however, certification which is required for specially state-funded positions (middle grades projects) and man month positions will be met in the manner outlined above.

Evaluation of Occupational Exploration Programs

Program Evaluation

Evaluation by school personnel is concerned with finding what is done in the school with students and how change may be brought about to help them realize their potentials as completely as possible. The evaluation process should be guided by the objectives for learners as outlined in a comprehensive curriculum plan. The evaluation of the sum total of the learners' progress can be directly related to the school's progress in planning.

With an occupational exploration emphasis in the curriculum, a variety of techniques of evaluation must be used to determine its effectiveness. In essence this evaluation is evaluation of the entire curriculum. Traditionally, formal tests, usually of a standardized and written nature, have been used as the main instrument of evaluation. Other forms of evaluation, including use of interviews, anecdotal records, experience diaries, check lists, and other forms of informal tests must be used more and more. Even with informal tests, however, there must be a common format and uniformity of application. Teachers, in particular, need to know a great deal about evaluation and how to use specific evaluative techniques.

There is a need to go beyond measuring of information learned and skills acquired. There is concern with the kinds of habits and attitudes children are forming. The question of concepts, thinking ability, interests, appreciations and personal adjustment must be considered. Additionally, the extent to which the student is using and applying knowledge and skills must be evaluated.

As the LEA sets up a continuous evaluation process the following questions might be considered:

- In what ways are we creating an atmosphere in which learners interrelate their learnings?
- What assumptions are we making about these students - their experiences, their interests, their abilities?
- In what ways are we insuring the inclusion of basic knowledge and skills in each student's school experience? How do we know?
- What guidance are we offering in improving the learning processes of each student?
- Are we developing the thinking potential of each student? How? How do we know?
- How are we helping each learner to accept responsibility?
- What guidance are we offering to help the student make sound decisions?
- By what means are we reinforcing the learner in his direction of achievement?

- Are we assessing the teaching processes that seem to impede the learning of some students?

Finally, it must be remembered the primary purpose of evaluation is the improvement of teaching and learning.

Student Evaluation

While decisions for grading rest with the local education agency, it is recommended that letter or numerical grades not be given for occupational exploratory activities. If the local unit requires that grades be given each student, it is felt that they should be based on the following criteria:

1. Development of good work habits.
2. Attitude toward work or performance.
3. Student initiative.

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Introduction to Appendices for
A Guide for Implementing and Conducting A
Middle Grades Occupational Exploration Program

The following appendices should be helpful to local units in designing in-service programs, arranging the various laboratories for exploratory programs, purchasing equipment, selecting supplies and teaching materials, and in developing instructional material. Each laboratory is described outlining some possible occupational cluster combinations. Equipment and materials lists are provided to assist in purchasing that most appropriate for exploratory experiences.

Each laboratory has an instructional prototype for individualizing instruction. It is hoped each teacher can use the example given for his or her laboratory area and develop additional instructional units for the clusters to be taught.

The following information concerning funding is provided in the hopes that by carefully reviewing these regulations many of the problems of the past for specially-funded projects can be eliminated.

Funds appropriated for exploration programs are to be used in providing instructional and supportive services to youth in grades seven through nine for the specific purpose of exploring the world of work. Expenditures may be made for additional instructional and supportive personnel as well as for equipment, materials, travel, transportation and other appropriate expenses directly tied to the objectives and guidelines of the exploration program and are necessary for its implementation.

Such expenditures as those for facility maintenance, basic classroom furniture for students and teachers, floor coverings, and other expenses normally associated with the operation of a school plant and its educational program must be borne by the local educational agency.

Such expenditures as the following may be made:

- A. Salaries, Instructional - Vocationally certified teaching personnel--full-time and part-time.
- B. Salaries, Supportive - Non-teaching personnel, para-professionals, guidance counselors, and other appropriate personnel.
- C. Fringe Benefits - Matching requirements for Social Security, retirement, hospitalization and disability insurance.
- D. Materials - Consumable and non-consumable instructional materials. *(Items must be appropriate and tied to the objectives of the program.)* Consumable supplies purchased through these funds may not be used to be made into products to be sold or for the personal use of teachers, students, or others. Costs for materials of a recreational, cultural, or general education nature must be paid for from other sources.
- E. Equipment - Instructional equipment applicable to the exploration program and tied to its objectives and guidelines. An inventory must be maintained on items costing \$200 or more. Costs for equipment of a recreational, cultural, or general education nature must be paid for from other sources.
- F. Contractual Services - Consultant fees and travel (subsistence must be paid for by the consultant)
- G. Travel - Official travel and subsistence costs and supportive salary personnel.
- H. Transportation - *Costs for student transportation or field trips directly tied to program objectives. Costs for field trips of a recreational, cultural, or general education nature must be paid for from other sources.*
- I. In-Service Workshops - Salaries or stipends, travel, subsistence and registration fees for in-service training of non-clerical personnel. Costs for substitutes may be paid only for those personnel employed through the exploration program.
- J. Other Expenses - Rental of space, communications, office materials and other costs directly attributal to the exploration program, its objectives and guidelines.

The State staff stands ready to assist any unit needing assistance in implementing and conducting an occupational exploration program. We can be reached by calling Area Code (919) 829-7977 or writing:

Middle Grades Occupational
Exploration Section
Division of Occupational Ed.
N. C. Department of
Public Instruction
Raleigh, N. C. 27611

STATE APPROVED
IN-SERVICE EDUCATION GUIDELINES
MIDDLE GRADES OCCUPATIONAL EXPLORATION

Introduction

Personnel in staff development at the local education agency is requesting that the State staff assist them in planning for in-service and/or pre-service for teachers, para-professionals, and administrators who wish to implement or improve a comprehensive occupational exploration program in the junior high-middle school. It is also indicated in the Occupational Exploration Teacher Certification Standards that "approved credit" from the chief consultant of occupational exploration must be recommended for issuance of certificate credit.

Therefore, the following in-service/pre-service guidelines are recommended:

- I. Name of LEA Sponsoring In-Service/Pre-Service Education

- II. Site of In-Service/Pre-Service _____
- III. Dates _____ (From) _____ (To)
- IV. Target Group

- V. Director of Staff Development and Planners

- VI. Teaching Staff

*It is strongly recommended that at least one member of the planning team has been fully certified in middle grades occupational exploration.

VII. Projected Number of Participants _____

VIII. Purpose

- A. Develop competencies needed to teach and administer a comprehensive occupational exploration program using simultaneous multi-teaching station in each laboratory.
- B. Develop a comprehensive curriculum design utilizing all disciplines in an exploratory program based on fifteen broad based clusters as outlined in the Guide For Designing and Implementing A Middle Grades Occupational Exploration Program.
- C. Develop an understanding of the three major components of occupational exploration.
 1. Infuse and correlate occupational information and activities into all subject areas
 2. Provide occupational information and student self-appraisal on group and individual basis (Guidance)
 3. Provide exploratory activities in the broad occupational clusters
- D. Develop locally initiated media, content, methods, and utilization based on manpower available, current curriculum trends, school organization, etc.
- E. Other

IX. Objectives

1. Provide students with opportunities and assistance for appraisal of their individual abilities, potentials, interests, desires, and needs.
2. Provide students with laboratory and classroom experiences and activities which correlate occupational information with all subject areas through the joint efforts of academic and exploration teachers.
3. Provide learning experiences which should assist students in identifying occupational opportunities (locally, statewide, and nationally) as well as exploring occupations and trends relative to the mobile labor force.

4. Provide students with educational experiences which are relevant to their career development process.
5. Provide individualized and group instruction and related services as are needed for students to enter the labor market or to continue their education.
6. Provide students with opportunities to nurture creativity, and develop technical problem-solving skills related to materials, tools, machines, and processes.
7. Provide students with opportunities to study the agricultural, economic, and industrial system by which goods and services are produced and distributed.
8. Provide students with assistance in developing desirable attitudes toward work and in recognizing the dignity of every occupation.
9. Provide students with opportunities to experience success and to develop personal pride.
10. Provide students with opportunities to experience activities in which they learn to accept responsibilities and to make decisions.
11. Provide students with opportunities to experience activities which familiarize them with occupational education opportunities at the high school and post-high school levels.

X. Basic Content

- A. Principles, philosophy, and concepts of occupational exploration
- B. Methods and techniques of teaching occupational exploration
- C. Experiences in the career clusters plus occupational information center activities

XI. Suggested Activities

- A. Overview, rationale, justification, objectives, philosophy, content outline, evaluation procedures _____ hours
- B. Methods and techniques _____ hours
- C. Guidance principles and practices _____ hours

- D. Field trips to "where the action is" _____ hours
- E. Resource personnel "bringing the action to you" _____ hours
- F. Experiences in the fifteen cluster areas working with materials, tools, equipment, processes, and procedures
- G. Curriculum Development _____ hours
 - 1. Infusion and correlation of subject content and career development
 - 2. Develop individualized instruction materials for students
 - 3. Develop a scope and sequence to fit local needs
 - 4. Develop multi-mediated approaches
 - 5. Other
- H. Other

XII. Seminars _____ hours

- A. Provide for group discussion periodically to critique practices and progress
- B. Provide for group discussion to summarize and indicate a plan of action

XIII. Evaluation

Evaluation will be done by both the staff and the participants.

Staff evaluation will concentrate on prior planning, conduct of the institute, responsiveness of the participants, and the degree to which objectives were met.

Participants' evaluation will concentrate on prior knowledge on the purpose of the institute, content of the institute, procedures used, the degree to which the objectives were met, and the perceived confidence to plan and implement an effective exploration program locally.

XIV. Suggested Resource Personnel and Implementers

- A. Local staff development personnel
- B. Guidance personnel
- C. Local occupational personnel - director and staff
- D. Experienced personnel in existing exploration programs especially those who have attended prior workshops and inservice programs.

- E. Department of Public Instruction Occupational Exploration staff
- F. Local business, management, industry, professional, etc., personnel
- G. Local Employment Security personnel
- H. Consultants - education, lay, organizations
- I. Teacher education institutions
- J. Other

APPENDIX B

BUSINESS & OFFICE OCCUPATIONS EXPLORATORY LAB

CONTENTS	PAGE
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BUSINESS OCCUPATIONS EXPLORATORY LAB

CLUSTERS: BUSINESS AND OFFICE
DISTRIBUTION AND MARKETING
COMMUNICATIONS AND MEDIA

As may be noted on the adjacent lab layout, there are a large number of student exploratory areas. It is doubtful that any school would be able to include all areas indicated. They have been included because they are considered appropriate and it is felt that schools will include those that they feel can be provided.

In offering instruction using the cluster approach, it should be understood that there is often an "overlap" within the clusters. Photography (studio & darkroom), silkscreening, printing and block printing included in this layout could be transferred to the Industrial Occupations Lab if more adequate instruction could result therein.

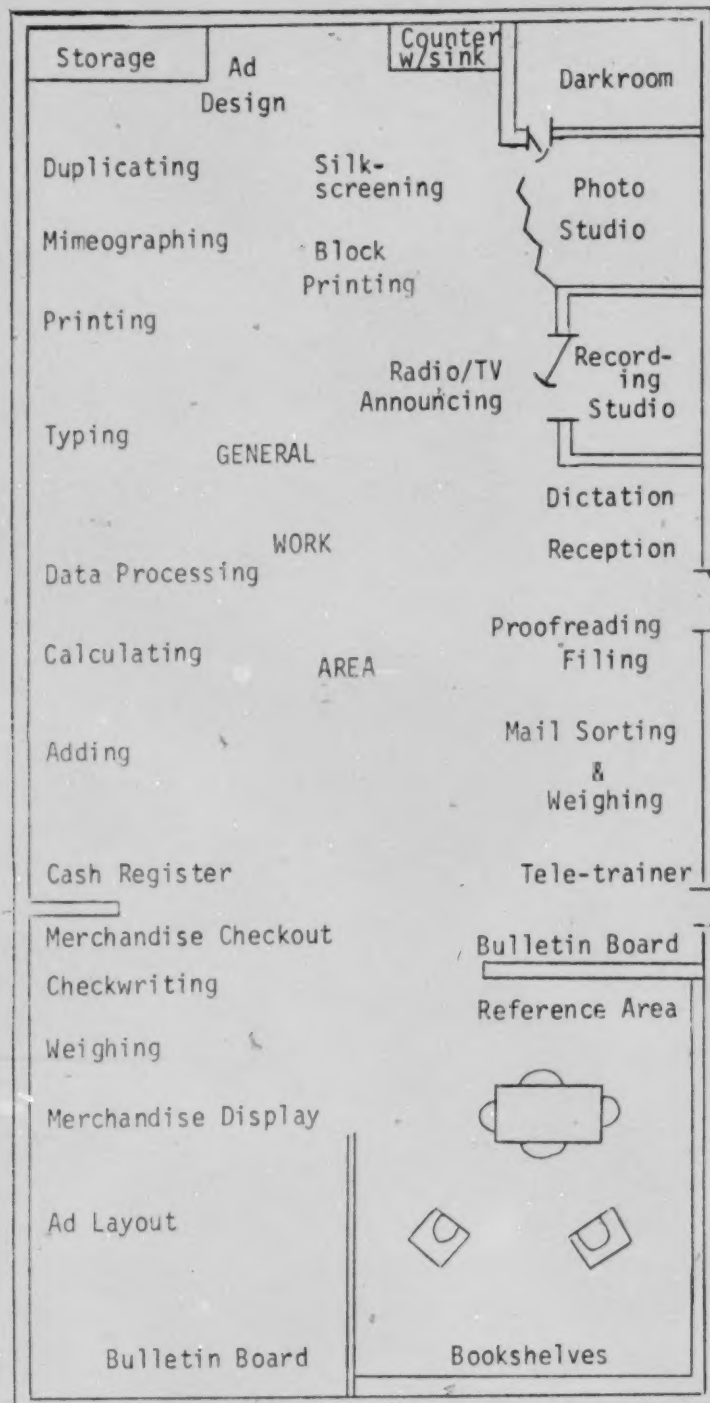
The floor plan indicates use according to environmental needs and activity area similarities. These activities could be categorized as one of the following: Quiet, Noisy, "Messy," "Noisy-Messy" and Busy. A quick glance at the layout will indicate that "duplicating" is located in a "noisy-messy" zone fairly close to the lavatory for cleanup purposes and adjacent to other fairly noisy activities. The intent is to preclude disturbance of "quiet" activities by others.

SPECIAL FACILITIES CONSIDERATIONS

Size:	Sample layout 1980 sq. ft. - very large Minimum recommended - 900 sq. ft. Considered optimum - 1500 sq. ft.
Lighting:	30-50 foot candles - glare free 30 ft. candles adequate for reception area 50 ft. candles needed in typing, ad layout, etc.
Ventilation:	Needed to eliminate toxic (darkroom) or offensive odors (Inks, paints, thinners, etc.)
Electricity:	Outlets desirable every 6 ft. around room Wiremold outlets around the perimeter are preferred
Carpeting:	Highly desirable in reference area and right hand side of lab up to and including photo studio. Could be used in most of lab, but would be a liability in printing or other "messy areas."
Safety:	Safety precautions should be exercised in all areas at all times. Goggles should be used in the darkroom.
Storage Areas:	Needed for overall supply storage of laboratory; student storage for uncompleted activities and personal belongings while in lab; aprons and protective coverings for use in photographing, printing, and mimeographing sections.

BUSINESS OCCUPATIONS EXPLORATORY LAB

CLUSTERS: BUSINESS & OFFICE, DISTRIBUTION & MARKETING AND COMMUNICATIONS & MEDIA



BUSINESS OCCUPATIONS EXPLORATORY LAB

CLUSTERS: BUSINESS AND OFFICE
DISTRIBUTION AND MARKETING
COMMUNICATIONS AND MEDIA

SUGGESTED FURNITURE AND FACILITIES:

1. Typing tables (5) (adjustable)
2. Tables (3) 36"x42"x96" or 4-6 trapezoidal tables
3. Round tables 72" diameter (2)
4. Storage cabinet 24"x96"x96" (2)
- *5. Teacher's desk (1)
6. Storage cabinets w/counter top 24"x144" (1)
7. Wall cabinets 16"x144"
8. Storage cabinets w/counter & sink 30"x96" (1)
9. Switchboard tele-trainer 48"x48" (1)
10. Bulletin Boards (wall) 48"x96" (3)
11. Showcase w/sliding glass doors (ceiling to wall) 48"x24"x10' (1)
12. File cabinets 52"x30" (4 drawer) (2)
13. Bookcase (1/2 wall) w/slanted shelves (2) & regular shelves (2) 72"x24" (1)
- *14. Appropriate seating
- *15. Ample electrical outlets or approximate 40' - 1' space wire mould strips
- *16. Darkroom w/safety lights, sink & water, base and wall storage approximately 5'x8'x wall height or 8' - (optional)
- *17. Recording studio - sound proof, approximately 5'x8' - electrical outlets, worktable and appropriate lighting - (optional)
18. Periodical rack
19. Portable bookcase/dividers

*Not to be purchased by State

BUSINESS OCCUPATIONS EXPLORATORY LAB

CLUSTERS: BUSINESS AND OFFICE
DISTRIBUTION AND MARKETING
COMMUNICATIONS AND MEDIA

MAJOR EQUIPMENT TO BE CONSIDERED:

1. Cash register
2. Spirit duplicator
3. Manual typewriters (4-6)
4. Adding machines (2)
5. Offset machine
6. Shorthand machine
7. Calculator
8. Camera
9. Enlarger
10. Mannequin
11. Checkwriter
12. Dictating machine
13. Scales - Postage/grocery
14. Stencil duplicator
15. Key punch or simulator
16. Cartridge type teaching machine
17. Printing press & accessories
18. Video camera & recorder
19. TV monitor
20. Duplicating cabinet
21. Sound on slide equipment
22. Audiovisual equipment, if not available from other departments, such as:
 - 16 mm sound projector
 - 8 mm projector
 - Strip/slide projector
 - Tape & record players
 - Audiovisual movable stands
 - Overhead projector

SMALL EQUIPMENT TO BE CONSIDERED

1. Styli (for stencils)
2. Silkscreen frame
3. Credit card charge machine
4. Cassette player (only)
5. Cassette recorder
6. Pliers
7. Assorted screwdrivers
8. Staplers
9. Rulers
10. Scissors
11. Tape dispensers
12. Soap dispensers
13. Photo developing trays
14. Card files - 3x5 or 4x6

BUSINESS OCCUPATIONS EXPLORATORY LAB

CLUSTERS: BUSINESS AND OFFICE
DISTRIBUTION AND MARKETING
COMMUNICATIONS AND MEDIA

LIST OF POSSIBLE SUPPLY NEEDS:

1. Cash register tape
2. Play money - bills & coins
3. Adding machine tape
4. Simulated groceries
5. Assorted materials for displaying
6. Lettering guides
7. Stencils
8. Correction Fluid
9. Spirit master units (several colors)
10. Stencil illustrations
11. Stencil protector covers
12. Stencil file folders
13. Mimeo ink
14. Manila folders
15. Canary second sheets
16. Mimeo paper
17. Duplicating paper
18. Copy or tracing paper
19. File cards with indexes
20. Junior high typing manuals
21. Sample charge booklets
22. Sample office forms
23. Sample order blanks
24. Block printing equipment & materials
25. Photographic film & supplies
26. Carbon paper
27. A-Z file guides
28. Numeric file guides
29. Cassette tapes
30. Sample deposit slips
31. Sample checks
32. Tool for pulling paper (keypunch)
33. Keypunch cards
34. Cartridges (teaching machine)
35. Glue
36. Magic markers
37. Typing erasers
38. Tacks
39. Tape-masking & transparent
40. Batteries for cassette
41. Pins
42. Duplicating soap (for hands)
43. Pencils
44. Sound on slide cartridges
45. Machine instruction cartridges
46. Ribbons for machines
47. Duplicator fluid
48. Appropriate inks
49. Telephone directories
50. Poster paints
51. Paint brushes
52. Poster paper
53. Silkscreen film & supplies

PROTOTYPE

ACTIVITY: Filing (Office)

CLUSTER: Business and Office Occupations

PURPOSE: Students will explore some of the varied systems of filing different forms, materials or documents as typically used in an "office."

APPROACH: This learning package is designed for use of students requiring minimal teacher assistance. Poor readers are likely to require varying amounts of assistance from the teacher or peers. (Non-readers will require a different method of information presentation or an activity more appropriate to their entry level skills.)

All students should complete the introduction, preview, Pre-test, Activities 1-4 and Post-test.

Activities 5 and 6 are optional for those students whose interests and abilities exceed those of the group. Further resources, audiovisual materials, and etc., may be used for vertical or horizontal expansion and/or enrichment.

The attached Learning Activity Package is predicated on specific entry level skills in the cognitive and psychomotor domains. The evaluation procedure may indicate affective changes in some students.

EQUIP. &

MATERIALS: File drawer, file box, check file or box
Geographic expanding file or geographic file guides
Packet of names of school personnel
Packet of key punch cards
Packet of cancelled checks
Packet of job titles
Packet of Eastern Seaboard city names
Packet of random personal names

EVALUATION: Student progress in exploratory programs should be evaluated constantly although it is not recommended that students receive grades. Specific knowledge or skill of job performance in all phases within each cluster is not expected to be uniform for each student. Rather it is expected that perhaps each student might acquire varied levels of cognitive and psychomotor learning according to individual interests, desires and needs. Therefore, a grading system designed to measure uniform performance from all students is unreasonable and dysfunctional. It should be expected that all students will learn enough to make appropriate elective decisions for future educational progress.

LEARNING ACTIVITY PACKAGE

CLUSTER: Business and Office Occupations

OCCUPATION: File Clerk

ACTIVITY: Experiences In Different Methods Of Filing

INSTRUCTIONS: Complete pre-test and ask teacher for Filing LAP. You are to complete Activities 1,2,3, & 4. You may complete Activities 5 and 6 if you wish.

INTRODUCTION: The correct and appropriate method of filing is very important to the efficient operation of any kind of business. This includes such broad areas of employment as manufacturing, selling, education, law, medicine and etc. Filing is also important to the home, family and each individual as it relates to personal records such as income, social security, banking records, birth certificates, deeds, insurance policies and other important documents and materials.

PREVIEW: Are you familiar with some of the systems of record filing? Have you assisted at school or home in any system of filing? Do you feel that you have personal information, documents or materials that you should file? What materials does some member of your family file? Do you think that you would like a job where part of your responsibility was filing?

PRE-TEST: Answer the following:

1. List as many systems of filing as you can think of.

_____	_____
_____	_____
_____	_____

2. When filing companies or individuals by name, they are filed _____
3. Cancelled checks are generally filed _____.
4. A letter from John J. Smith should be filed behind the _____ file guide.
5. Letters from John A. Adams and John Lassiter Adams are to be filed. Which one is filed in front of the other? _____
6. Ninety per cent of all filing is _____.

ACTIVITY 1: Filing names of school personnel in file drawer

Using a packet of names of school personnel and a file drawer:

1. File names according to the last name (printed first), behind the correct letter guide.
2. Be sure to arrange the names in alphabetical order within each letter guide.

ACTIVITY 2: Filing names in a geographic file

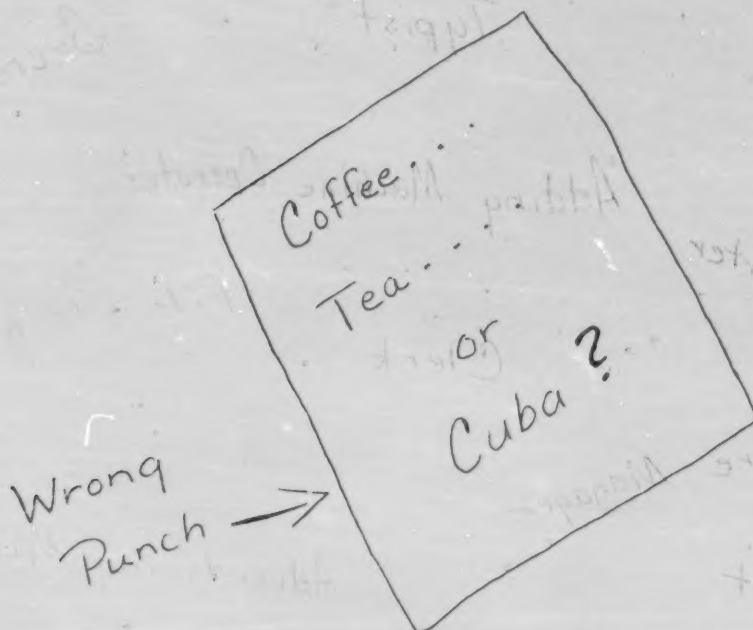
Using a geographic expanding file or file drawer and a packet of names of cities on eastern seaboard:

1. File the names of cities with the corresponding states on the eastern seaboard.
2. File the cities behind the correct state guide.
3. Be sure to arrange the names of cities in alphabetical order within each letter guide.

ACTIVITY 3: Filing key punch cards

Using a packet of key punch cards and a file box:

1. File the names in the box file provided behind the correct letter guide.
2. Be sure to arrange the names in alphabetical order within each letter guide.



ACTIVITY 4: Filing canceled checks by number

Using a canceled check file (numeric) and a packet of canceled checks:

1. File the checks in front of the guides which have been classified by number (10 checks in each file).
2. Be sure to put the checks in exact numerical order within each guide so that the first check is #5680 following in exact number order to the very last check #5889.

Now take post-test! If you desire, complete Activities 5 and 6.

ACTIVITY 5: Filing job titles

Using an expanding file or file drawer and a packet of job titles:

1. The file that you are about to do is a subject file.
2. File the job titles under the correct subject area. (You will find some that could go in more than one subject.)
3. File the job titles in front of the correct subject file.
4. Be sure to arrange the names in alphabetical order within each subject file.

Cashier

Typist

Secretary

Adding Machine Operator

Newspaper Reporter

File Clerk

Clerk

Store Manager

Receptionist

Advertising Manager

ACTIVITY 6:

Indexing and filing personal names

Using an expanding alphabetical file or file drawer and a packet of personal names:

1. File the names, indexing them as you file. Refer to hints below:
 - a. Use last names.
 - b. If the last names are the same, use the first names; for example, Alfred Adams comes before Earl Adams.
 - c. If the first names are also the same, use the middle names; for example, Alfred Eugene Doan comes before Alfred George Doan.
 - d. Put initials before names that begin with the same letter; for example, J. C. Allen comes before John C. Allen.
 - e. If Jr. and Sr. follow two names that are alike, the Jr. comes first; for example, C. B. Jones, Jr., comes before C. B. Jones, Sr.
 - f. A hyphenated last name is considered one work; for example, Hall-Quest.
 - g. A last name with a prefix is considered one work; for example, MacDonald.
2. File the names in front of the correct file guide.
3. Be sure to put the names in alphabetical order within the letter guide.

POST-TEST:

When you feel you are ready, ask your teacher to review what you have done and give you the post-test. This should help you to understand the activities you have completed and why they were included.

(Pre-test and post-test may be the same.)

CLUSTER: BUSINESS AND OFFICE OCCUPATIONS

Possible Units of Instruction (Activities)

1. Proper use of the telephone (borrow a tele-trainer).
2. Fill out an invoice practicing catalog sales.
3. Operate a cash register.
4. Operate an adding machine.
5. Operate a calculator.
6. Operate a duplicator.
7. Operate a mimeograph.
8. Operate a typewriter.
9. Count change.
10. Write checks using checkwriter.
11. Use a dictating machine (or cassette recorder).
12. Operate data processing equipment.
13. Transcribing activities.
14. Bookkeeping procedure activities.
15. Prepare carbon master.
16. Filing (alphabetically, numerically).
17. Use of deposit slips, passbooks.
18. Shorthand activities.
19. Set up a mock bank (checking, savings, investments).
20. Set up a corporation.
21. Field trips to an office.
22. Games (occupational).
23. Resource people in related careers.
24. Want ads (find occupations related to cluster).
25. Make a bulletin board.
26. Type a letter in business form (block, modified block, etc.).
27. Role play receptionist receiving callers.
28. Type (or print) a legal document with cover.
29. Do a resume sheet on yourself.
30. Make a graph indicating your grades.
31. Using your allowance, prepare a profit and loss statement (personal).
32. Using the numerical filing system, make a student directory.
33. Using the geographical filing system, make a student directory (streets, etc.).
34. Set up an inter-class post office printing your own stamps and making your own envelopes.
35. Clean a typewriter.
36. Change ribbon on a typewriter, calculator or adding machine.
37. Draw floor-plan for an office placing furniture in functioning, practical manner.
38. Assign student to serve as classroom receptionist.
39. Operate a telephone switchboard.
40. Visit a publishing company.

CLUSTER: COMMUNICATIONS AND MEDIA

Possible Units of Instruction (Activities)

1. Gather news about the school, edit for class paper.
2. Write a technical article for class paper.
3. Take photograph, develop film, prepare for half-toning and printing.
4. Operate an offset press or duplicator.
5. Prepare a master for above.
6. Make personalized note pad - using all essential processes.
7. Rebind a book.
8. Visit a print shop, lithography lab and/or photo lab.
9. Gather news, record on cassette and play for class as part of radio program.
10. Visit a T. V. station.
11. Visit Western Union.
12. Visit a two-way communication shop.
13. Visit the telephone company - operator position, control office, plant equipment.
14. Operate a credit card charge machine.
15. Take a group photograph of class, develop negative, make enlargements and several contact prints.
16. Take a photograph of an unusual scene - develop and print.
17. Set in type your name, address, etc., for your personal card in a composing stick.
18. Justify type, proof, lock, prepare, make ready and print 50 cards.
19. Role play placing of long distance calls using dummy telephone or tele-trainer.
20. Make paper.
21. Make an original design and transfer to linoleum block for block printing.
22. Make your own Christmas cards using silkscreen, block print, etc., process.
23. Design class or school emblem to silkscreen on student's teeshirts.
24. Make a telephone directory of class members and print for each student.
25. Make a transparency.
26. Run a projector.
27. Plan a church bulletin for following week.
28. Set up an appointment book for a doctor.
29. Arrange appointment ledger for a beauty shop with several operators.
30. Time students doing certain jobs - similar to a time and motion study.
31. Visit a commercial bank or federal reserve bank.
32. Complete a simplified state or federal income tax return.
33. Fill out charge card applications.
34. Prepare a bulletin board using example of different kinds of credit slips.
35. Prepare an exhibit of bills received in home which have been keypunched.
36. Proofread for spelling and grammatical errors in boss's letters.
37. Make a petty cash report.
38. Form an assembly line and collate pages.
39. Do an expense report for a traveling salesman.
40. Operate a thermal copy machine.
41. Make chart showing how to change type setting for typing stencil.
42. Prepare a skit on a good interview and a bad one.
43. Be a store manager. Explain to a new sales clerk what her duties will be.
44. Visit a computer center.
45. Operate a stenotype machine.
46. Make up memo from boss to employees - (Ex: office party, insurance notices)
47. As secretary, sort mail for boss.
48. Compute deduction from payroll check.
49. Type business forms.
50. Work at a motel desk; check people in and out.

CLUSTER: MARKETING AND DISTRIBUTION

Possible Units of Instruction (Activities)

1. Operate a cash register.
2. Create a counter and window display.
3. Operate a mock retail store (logging, marketing, stocking, weighing).
4. Design, make and market a product.
5. Create an advertisement layout for newspaper, and/or magazine.
6. Model garments.
7. Make a billboard sign.
8. Make a floral arrangement for a customer.
9. Do package wrapping.
10. Make bows for packages.
11. Design a package.
12. Write advertisement slogans for products.
13. Prepare commercials for radio and TV.
14. Handle a catalog sales invoice.
15. Inventory goods in mock retail store.
16. Roleplay salesmanship techniques.
17. Field trips to a grocery store, department store, etc.
18. Design and make out a gift certificate.
19. Inventory supplies in the classroom.
20. Roleplay automobile salesman (obtain brochure on favorite cars from dealer).
21. Hold an auction.
22. Roleplay person obtaining a car loan from bank - collateral, salary, savings, etc.
23. Weigh letters or packages and determine cost for mailing.
24. Weigh produce selling for 29¢ a pound and calculate cost.
25. Prepare campaign for school homecoming game, Red Cross drive, etc.
26. Have a mock or real "After Christmas Sale," "White Sale," or "End of Summer Sale."
27. Analyze a window display.
28. Invite resource speakers to talk about setting up a corporation.
29. Prepare a list of supplies and cost for a concession stand.
30. As a delivery man, plan shortest routes for delivery. Use city map.
31. Visit a paper plant.
32. Create ad layout for school newspaper.
33. Prepare inventory of equipment in room.
34. Design a "give away" (Ex.: sticker, memo pad, etc.) for a company's advertising department.
35. Plan a route for a traveling salesman. Use his list of customers to file geographically.
36. Using yellow pages of telephone directory, prepare a prospect list for a salesman.
37. Design price special signs (or leaders) for market, drugstore, etc.
38. Visit a trade show.
39. How to figure sales tax - tax rate charts, pencil and paper method.

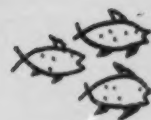
APPENDIX C

ENVIRONMENTAL OCCUPATIONS LABORATORY

ENVIRONMENTAL OCCUPATIONS



Agri-Business & Natural Resources



Marine
Science



Hospitality &
Recreation



Environmental
Control

FACILITIES

EQUIPMENT

MATERIALS

ACTIVITIES

ENVIRONMENTAL OCCUPATIONS EXPLORATORY LABORATORY

SUGGESTED EQUIPMENT AND MATERIALS LIST

Introduction

Suggestions for equipment, materials, and physical facilities needed for equipping and conducting activities around occupations in the clusters grouped under the laboratory entitled "Environmental Occupations" are presented in the following pages. The clusters included in this laboratory are Agri-Business and Natural Resources, Environmental Control, Marine Science, and Hospitality and Recreation.

Page two includes a suggested physical plan and physical facilities for the Environmental Occupations Laboratory. Information and plans on pages three and four relate to a Greenhouse structure which is needed to enhance the opportunities for student activities in the horticultural area for the Agri-Business and Natural Resources cluster.

The list of materials and equipment deemed desirable for conducting activities within the clusters is considered flexible as needs change for the laboratory. Some materials would be expected to be interchanged between other laboratories or could perhaps be borrowed. Teacher initiative, improvising, borrowing, and various other techniques to acquire materials and equipment is encouraged. Much of the equipment and materials listed may be found in agricultural supply catalogs. Other materials and equipment (some free) may often be secured from the following agencies:

County Extension Chairman (Extension 4-H Bulletins)

Soil Conservation Service (Federal and Local) Booklets

Forestry Service (State and Local)

Wildlife Commission (State and Area)

Commercial Fisheries (State)

N. C. Department of Agriculture (State)

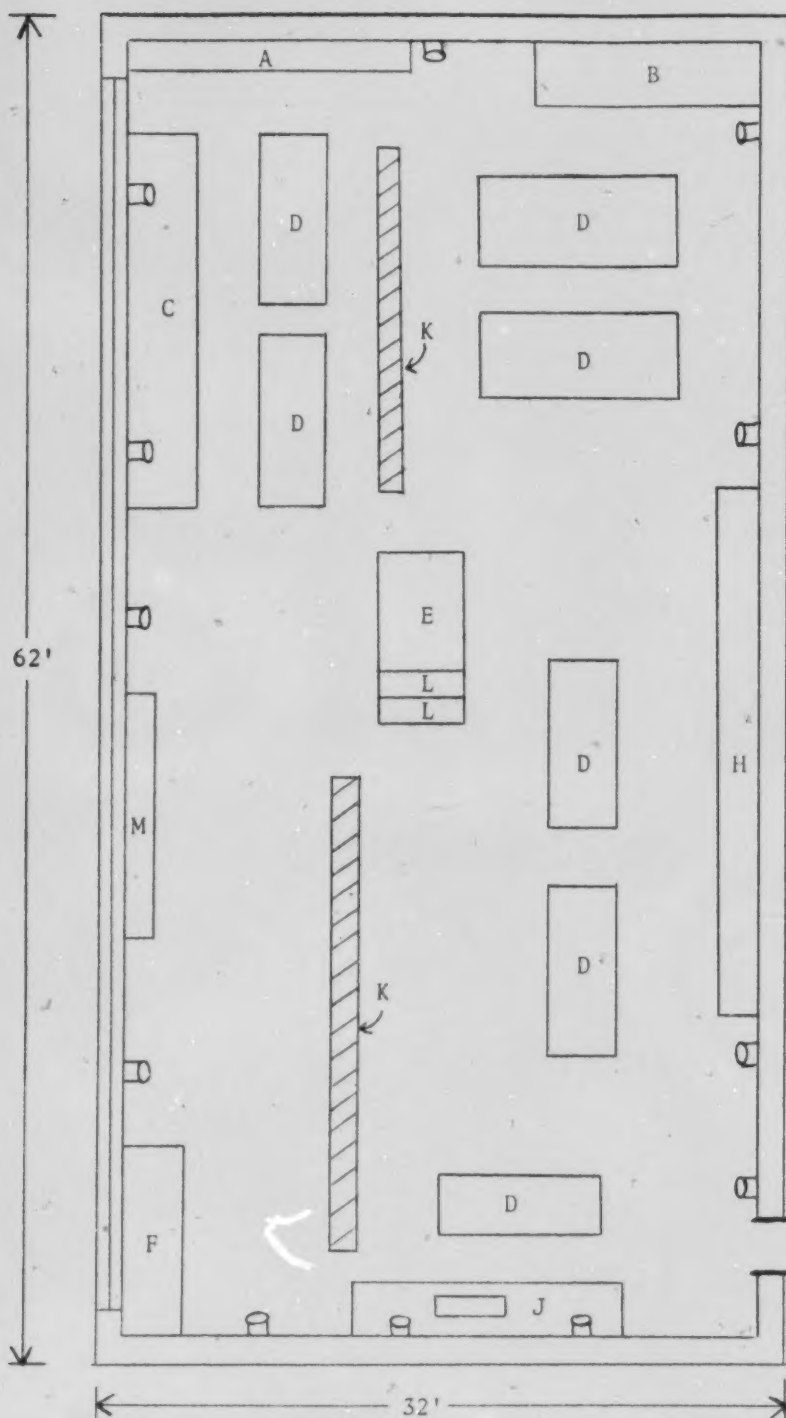
(Source of soil boxes, seed germination, feed regulations, grading of farm products)

N. C. Department of Labor

(Labor regulations regarding occupations)

A prototype following a specific format has been used to develop a learning activity package titled, "Using Road Maps to Plan Vacation Routes". It is included on pages 5-10 and is an example of what may be done to develop other learning activity packages from the list of suggested activities on pages 11-16.

SUGGESTED ENVIRONMENTAL OCCUPATIONS LABORATORY PLAN



SUGGESTED PHYSICAL FACILITIES

Legend

- a-magazine rack 18" X 138"
 - b-tool cabinet 30" X 132"
 - c-counter top/work area/cabinets underneath 30" X 141"
 - d-area work tables 54" X 66"
 - e-teacher desk 36" X 48"
 - f-storage closet 360" X 96"
 - g-sink 36" X 42"
 - h-book shelf 18" X 312"
 - i-storage cabinets 18" X 186"
 - j-counter w/sink 30" X 192"
 - k-movable screen
 - l-filing cabinet w=16" l=24"
 - m-Black Board 144"
- Bulletin Board

CLUSTERS:

- Agri-Business & Natural Resources
- Environmental Control
- Marine Science
- Hospitality & Recreation

Scale 1/8"=1'

SUGGESTED GREENHOUSE INFORMATION

A greenhouse is recognized as an important facility for providing opportunities for the Environmental Occupations Exploratory Laboratory and especially for the Agri-Business and Natural Resources Cluster. Therefore, each school should consider the possibilities for providing a greenhouse. The general cost range of a 14' X 14' or 14' X 18' fiberglass greenhouse with ventilation fans, heating equipment, and temperature controls along with other installation costs will approximate \$1,000 to \$1,500 depending upon the amount of work absorbed by the local school or administrative unit.

Suggested Bill of Materials for Greenhouse (14' X 20'):

Sills: 68 Linear ft. 2" X 6" @ 31¢	\$ 21.08
Plates: 68 Linear ft. 2" X 4" @ 20¢	13.60
Purlines: 68 Linear ft. 2" X 4" @ 20¢	13.60
Studs: 270 Linear ft. 2" X 4" @ 20¢	54.00
Rafters: 220 Linear ft. 2" X 4" @ 10¢	44.00
Ridgeboard & Bracing: 130 Linear ft. 1" X 4" @ 10¢	13.00
Door (Aluminum) 3' X 6'	25.00

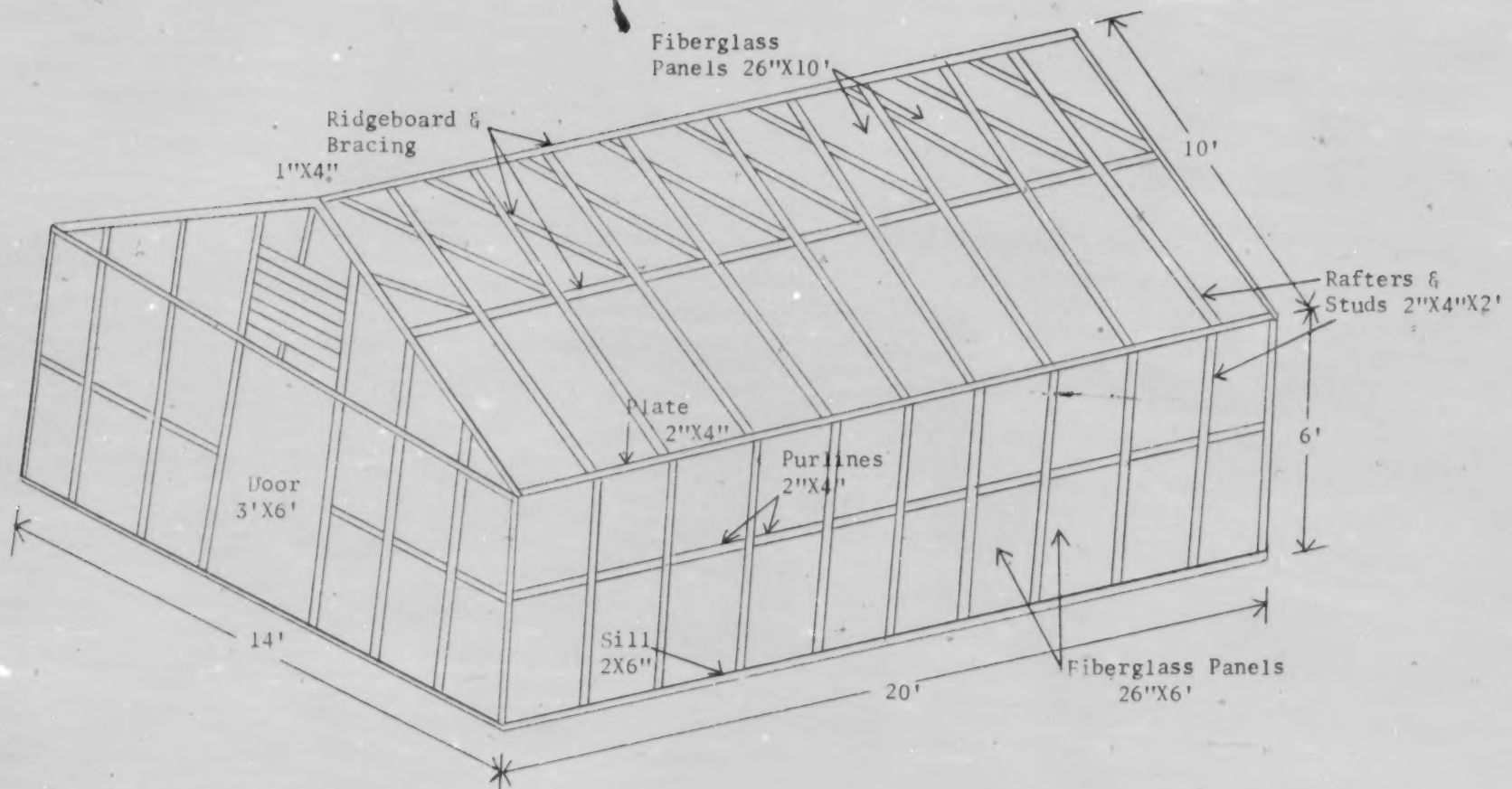
Fiberglass:

Ends and Slides: 32 pcs (26" X 6')		856 Sq. ft. @ 27¢	231.12
Gables: 6 pcs (26" X 6')			
Roof: 20 pcs (26" X 10')			
*Estimated Cost			<u>\$415.40</u>

*Excludes:

Heating Unit
Exhaust fan and Shutter
Wiring and Plumbing
Bolts, nails and fiberglass accessories
Concrete footing

SUGGESTED GREENHOUSE PLAN



- Note: (1) All wood should be treated.
 (2) The foundation footing should be prepared with concrete.

PROTOTYPE
(Sample)

ACTIVITY: Using Road Maps to Plan Vacation Routes

CLUSTER: Hospitality and Recreation

PURPOSE: Students will explore the techniques of a road map to plan travel between departure and destination points in the most economical way. In addition, the student will be able to figure gas mileage and other problems involving travel.

APPROACH: This activity is prepared for students who will require limited help from the teacher. Students who are poor readers may require additional help from the teacher or from other students who are faster readers.

EQUIPMENT,
MATERIALS,
AND RESOURCE
MATERIALS: PRE-TEST
PAPER AND PENCIL
RULER
Road map of North and South Carolina by the American Oil Co.
1972 North Carolina Travel Survey: An Economic Analysis.
Published by Travel and Promotion Division, Department of
Natural and Economic Resources, Raleigh, N. C.

EVALUATION: Exploratory activities are not to be graded, but student progress is to be evaluated continuously. Specific knowledge or skill related to the performance of a job is not expected to occur. However, the teacher will want to provide adequate guidance based on an informal evaluation of how the student is progressing in understanding the nature of the work, the skills, attitudes, and values that must be developed by workers in order to sequence future learning activities. The informal evaluation will also suggest the development of additional learning activities and teaching materials.

LEARNING ACTIVITY PACKAGE

CLUSTER: Hospitality and Recreation

OCCUPATION: Traveling Clerk
(D.O.T. 237.168)

ACTIVITY: Using Road Maps to Plan Vacation Routes

INSTRUCTIONS: You will complete the PRE-TEST your teacher will give you.
(You need not worry if you do not know the answers to all the items. The purpose of this learning activity is to recognize what you do not know and then learn the unknown.)

Do activities 1, 2, 3, 4, and 5.

When you have completed all activities ask the teacher to let you take the POST-TEST.

INTRODUCTION: The occupation of a traveling clerk is an important one. The traveling clerk must plan routes to assist the vacationer to travel those highways that include points of service, historical and other interests that the vacationer has requested. Highway numbers should be clearly indicated and detours marked and alternate routes suggested. Travel time and mileage between points to be covered each day as well as the indicated highway speeds allowed is important information that should be provided the vacationer. Other information the traveling clerk may provide is rest stop locations, parks, restaurants, and motel accommodations and locations. The enjoyment you have on your vacation may very well rest with the traveling clerk's efficiency.

PREVIEW: Would you like to take a two-week vacation? Where would you go? What would you like to see? Where could you get assistance to plan your route? What would the expense of the trip be? The cost of the automobile expense? Would State and Federal parks be places you may like to visit? What other questions would you want to ask?

Questions in the above paragraph are stated in a way that indicates you would be planning and going on a vacation yourself. Perhaps you will; however, as you work through this learning activity you should evaluate the experience in terms of what your likes and dislikes would be if you were doing this for other people in a part-time or full-time employment position.

PRE-TEST (Use the attached map to answer the following)
Answer the following in _____ minutes or less.

1. How far is it from Asheville, North Carolina to Anderson, South Carolina? _____ miles
2. On the map, a straight line from Charlotte to Columbia is approximately 3 1/2 inches long. How many miles is this? (You may use your map for information) _____ miles
3. How far is it from Sanford to Tramway? _____ miles
4. The direct mileage (as the crow flies) from Charlotte to Durham is _____. The highway mileage is _____. How much further is it to drive that than to fly? _____ miles.
5. If Mr. Jones gets 16 miles per gallon of gas, how many gallons will he use in driving from Raleigh to Gastonia? _____ (to the nearest gallon)
6. The largest city in North Carolina is Charlotte. The largest in South Carolina is Columbia. How many more people live in Charlotte than in Columbia? _____

ACTIVITY 1: Finding cities and towns on maps

Find the city and town index. The first town listed for North Carolina is Aberdeen. Out to the side of Aberdeen you see C-6. Can you locate Aberdeen using this code? If so, go on to Activity II. If not, complete this activity.

Looking down the left edge of the map you see A through H. Across the top the numbers 1 through 10. Find C and 6.

Move across from C and down from 6. Aberdeen is located in the area where these lines cross. Can you find it? if not, get help from your teacher or a classmate.

Just for fun, pick out several other cities or towns and find them on the map.

ACTIVITY 2: Locating distances using the mileage chart

Using the mileage chart can you find how far it is from Greensboro to Charleston? If so, go on to the next activity. If not, complete the following.

On the mileage chart, look down the column on the side until you locate Greensboro. Now look across the top until you find Charleston. If you drew a line straight across from Greensboro and down from Charleston, they would cross at 278. This tells you it is 278 miles from Charleston to Greensboro. Understand? If not, call your teacher or get help from a classmate.

Find the distances between the following places?

Burlington and Concord. _____ miles
 Asheville and Elizabeth City. _____ miles
 High Point and Fayetteville. _____ miles
 Orangeburg and Greenwood. _____ miles
 Roanoke Rapids and Greenwood. _____ miles

See if you can locate all of the cities named above on the map.

ACTIVITY 3: Find distances of places not named in the mileage chart.

Can you tell how far it is from Sanford to Tramway? From Sanford to Lillington? If so, go on to the next activity. If not, complete the following.

Find Sanford and find Tramway. Do you see a number printed very lightly between the towns? Is that number 3? This means that it is 3 miles distance from Sanford to Tramway.

Find Sanford and find Lillington. If you look closely you will find a red arrow or dart pointed at each of these towns.

Printed on the line representing the highway between Sanford and Lillington, you will find a red 24. This means that it is 24 miles from Sanford to Lillington.

Now find out how far it is between the following places:

Sanford and Gulf. _____ miles
 Gulf and Goldston. _____ miles
 Goldston and Mt. Vernon Springs. _____ miles
 Mt. Vernon Springs and Siler City. _____ miles

What is the total mileage of the above? _____ miles

How far is it from Sanford to Siler City according to the red number between the darts? _____ miles

Reading the red numbers how far is it from Siler City to Asheboro? _____ miles. From Asheboro to Lexington? _____ miles. What is the total distance from Sanford to Lexington? _____ miles.

ACTIVITY 4: Applying the knowledge you have learned about reading a map

Mr. Adams, a salesman, drove the following route one week. He left his home in Charlotte and drove to Columbia where he spent Monday night. On Tuesday, he drove on to Asheville. On Wednesday, he made calls in Winston-Salem, High Point, and Greensboro in that order. On Thursday, he went to Raleigh and was back home again by Thursday night. How many miles did Mr. Adams travel between cities during the week?

_____ miles

If Adams checks his odometer and determines that he drove a total of 714 miles, how much driving did he do within the cities he visited?

_____ miles

If Adams determined that he got 15 miles per gallon of gas, how many gallons did he use (round off to nearest whole gallon)?

_____ miles

If gasoline cost him an average of 38.9¢ per gallon, how much did he pay for the gas he used?

_____ miles

Determine as accurately as you can how far Adams would have traveled if he could have moved in a perfectly straight line between each of the cities.

_____ miles

ACTIVITY 5: Planning a vacation trip

Plan a direct vacation route with Raleigh as a departure and destination point. Include the following sites: Blowing Rock, Beech Mountain, Grandfather Mountain, Clingmans Dome, Chimney Rock, and Southern Pines.

How many miles was it? _____ miles

YOUR TEACHER HAS THE ANSWERS TO ALL THESE PROBLEMS. WHEN YOU ARE READY TO CHECK THEM, ASK THE TEACHER FOR THE ANSWER SHEET.

POST-TEST

When you feel that you are ready, ask your teacher for the post-test. The post-test will help you see if you have understood the activities you have completed. (The post-test may be the same as the pre-test.)

SUGGESTED ACTIVITY TITLES FOR ENVIRONMENTAL OCCUPATIONS LABORATORY

The list of activities that follow are suggested and is not all inclusive for any of the clusters in Environmental Occupations Laboratories. It is often debatable as to which activity may be specifically in one cluster, and it is highly possible that the activity may fit into another cluster just as well. It is recommended that each instructor in each laboratory be aware of this situation so as to avoid having the same activity attempted in two different laboratories. Furthermore, each activity should be weighed in terms of the "Criteria for Selecting Exploratory Activities" established by the Occupational Exploration section which read as follows:

1. The activity simulates the performance of a typical job task.
2. The activity simulates the skills that may be developed in high school offerings.
3. The activity provides occupational information.
4. The activity provides an opportunity for students to appraise themselves in relation to present and future educational opportunities as well as to jobs in the world of work.

Agri-Business and Natural Resources Cluster

Take a soil sample.

Prepare a seed bed for seeding a lawn.

Examine "what's in a bag of fertilizer" (Example 10-10-10)

Read a soil sample report.

Visit and observe activities in the soil testing laboratory in Raleigh (N. C. Department of Agriculture).

Watch a demonstration by someone using a soil testing kit.

Observe how a state seed inspector checks seed for purity.

Observe a state feed inspector checking feed for content.

Conduct a germination seed test.

Prepare a visit to observe activities at one of the following:

Tobacco farm

Cotton farm

Small grain farm

Sweet potato

Irish potato

Peanut farm

Etc

Visit and observe workers in a feed mill.

Lay out a tract of land one acre in area.

Conduct an experiment to study plant growth in different plant growing media.

Prepare a soil profile for display.

Disect a didot seed.

Collect, label, and mount kinds of feed.

Grade different crops--tobacco, cotton, corn, small grain, etc.

Plant different size seeds to appropriate depths.

Find, mount, and label rocks for a collection.

Sift and pan a bucket of dirt for minerals or stones.

Prepare a sandbox model showing terracing.

Prepare a sandbox model showing erosion effects.

Prepare a sandbox model showing strip-cropping.

Cross pollinate corn.

Screen soil to observe soil particle sizes.

Conduct a plant pollination experiment.

Conduct a hydroponic experiment for growing plants.

Hatch eggs in an incubator.

Grade eggs by weight.

Candle eggs for quality.

Feed baby chicks.

Prepare for and make a field trip to observe:

Poultry processing

Broiler growing

Laying production (poultry)

Turkey raising

Poultry vaccinations

An animal hospital (veterinarian)

Plan and visit a meat processing plant to study activities of employees.

Plan and visit an abattoir to study activities of employees.

Plan and visit a dairy farm to observe a milking operation.

Plan and visit a dairy processing company.

Make a chart of market beef and swine cuts.

Prepare and grow an animal for a show.

Collect leaves and identify trees.

Identify 5 or more products made from lumber.

Determine age of trees by observing sawed disks from trees.

Use an increment borer to determine age of trees.

Determine age of trees from stumps of trees recently harvested.

Use a log scale to estimate board feet of standing timber.

Prune dead limbs from trees on the school ground.

Plant a tree.

Plant tree seedlings.

Measure the diameter of trees with a scale stick.

Measure the diameter of trees with a tree caliper.

Mark a stand of pines for thinning.

Examine a collection of wood samples for the hardness of different woods.

Make a piece of plywood.

Make paper from wood.

Identify 5 or more diseases of trees.

Identify 5 or more insects that cause damage to trees.

Fertilize a tree according to the prescribed method.

Collect seeds from different trees.

Describe and identify 5 or more recommended trees for home landscaping.

Use tree wound dressing for pruned limbs and tree damage wounds.

Visit a forest nursery.

Observe the fighting of a forest fire.

Plant a seed in a "Jiffy 7" starter.

Transplant plants started in a "Jiffy 7" starter.

Root cuttings.

Plan a fieldtrip to observe operations in a Greenhouse.

Mix soil media for potting plants.

Propagate roses or other plants.

Plant a hanging basket.
 Grow daffodils or other bulbs in pots.
 Sterilize a soil media or planting area.
 Prepare a flat for planting seed.
 Plant a porch planter.
 Label ornamental plants.
 Air-layer a rubber plant.
 Transplant plants grown in flats to field or into pots.
 Prepare and plant a garden.
 Weed a garden or a flower bed.
 Prepare rows and set strawberry plants.
 Design landscape plans for a home or a school area.
 Prune rose bushes.
 Prune flowering evergreen shrubs.
 Prune grape vines.
 Spray plants with insect and disease control materials.
 Observe effects of different periods of light and darkness on plants.
 Grade different vegetables--sweet potatoes, tomatoes, irish potatoes, cucumbers, etc.
 Observe a fruit harvesting operation.
 Calibrate a hand-sprayer.
 Discuss 10 or more insecticide safety rules.
 Root prune a tree.
 Dig, ball, and burlap a tree or shrub.
 Identify 10 or more annuals used as border flowers.

Environmental Control Cluster

Construct a fish or animal trap.
 Trap an animal or fish or both.
 Design a "No Hunting" posted sign and find out regulations for enforcing its intent.
 Learn local game & fishing regulations.
 Plan and make a nature trail.
 Prepare and start a cricket raising project.
 Visit and observe activities in a frog raising farm.
 Make bird feeders.
 Make bird houses.
 Make bird feeders from pine cones.
 Make a wood duck home.
 Plant annual, serecia, and bicolor lespedeza for wildlife food.
 Plant multiflora rose for borders and wildlife protection.
 Build a fish reef from tires or other materials.
 Make an identification set of cards from pictures of freshwater fish.
 Visit a museum to observe poisonous and non-poisonous snakes.
 Test drinking water for acidity, mineral content, and pollution. Compare these results with tests from stream water.
 Visit a weather station to observe what activities the personnel perform.
 Mount a rain guage and record precipitation daily.
 Read a thermometer and record temperature.
 Fertilize a fresh water pond.
 Stock a pond with fish according to kinds and recommendations.
 Bait a rat infested area with rat poison.
 Prepare and start a worm bed in a tub or plywood box.

Stock minnows for sale purposes.
 Have students make a barometer.
 Have a person from a civil defense office demonstrate radiation and its detection before the class.
 Collect some waste materials and process them into useful products. (Example: Broken glass can be mixed with polyester resin and molded into paper weights or lamp bases.)
 Locate an eroded area either on the school grounds or nearby and plant some type of recommended ground cover.
 Construct a terrace to prevent erosion. (A sandbox model may substitute.)
 Construct a retaining or restraining wall to preserve the aesthetic value of the school ground.
 Perform an air borne dust test--compare an oiled white cloth in a classroom and shop which is left in each for an equal length of time.
 Using the appropriate detection instruments, determine the amount of unburned fuel escaping from chimneys and automobiles.
 Examine the filters in a swimming pool to observe the amount of residue and debris collected.
 Analyze water for organisms using the microscope.
 Test various brands of detergents for the amount of sedimentation.
 Pick a spot in the community that is becoming increasingly polluted and design a model which will correct the problem.
 Have students engage in an essay contest. The topic might be "How to Utilize Junk Cars and Improve our Environment". (An environmental expert should be asked to judge the contest.)
 Take a field trip to the Environmental Health Center in the Research Triangle Park in Raleigh.
 Have an environmental specialist speak to the class about the ecological problems in the immediate vicinity.
 Conduct a school-wide contest to determine which room will maintain the lowest level of pollution.
 Begin a landfill in a badly eroded area.
 Visit a nearby body of water to observe pollution--particularly that caused by engines such as outboard motors.
 Have a forester talk with students about job opportunities for forest rangers and other conservation personnel in the forest service.
 Make a local environmental survey.
 Conduct a percolation test of different soils.
 Make a terrarium with live plants and organisms.
 Visit an ecology center to learn what occupations exist in this area.
 Study how environment affects plants and animals.
 Visit a nuclear reactor center.
 Test for radioactivity with geiger counter.
 Make an anemometer.

Marine Science Cluster

Make soundings for water depths.
 Tie basic knots used for boating activities.
 Tie basic knots in preparing fishing equipment.
 Make semaphore flags and learn to send messages.
 Learn the Morse Code and use it to send messages by sound or light.
 Make an identification set of cards from pictures of salt water fish.
 Make a list of items one would place in the first aid kit and keep in a life boat.

- Make a list of "K" rations (emergency foods) one would prepare to keep in life boats on a ship.
- Scrape and steel brush a rusty deck or bulkhead, prime with red lead, and finish with metal paint.
- Prepare a mixture of red lead for painting rusty spots on a steel deck.
- Study the meaning of different types and colors of buoys used in channels and other places.
- Learn the meaning of different horn signals used by boats and ships and practice these with a buddy.
- Prepare a conversation using words used by seamen.
- Make a fish net using appropriate knot tying techniques.
- Go fishing in a nearby body of water and identify each species of fish caught.
- Take a field trip to observe shrimping operations.
- Invite a resource person from the North Carolina Fishing Industries to speak to students about employment opportunities in the industry.
- Build and stock a fish nursery.
- Have a local game warden conduct a fish count and also determine the food supply.
- Establish a balanced aquarium.
- Observe unusual marine life such as a seahorse and determine the difference in his method of swimming.
- Dissect fish, crayfish, lobster, etc. to determine the difference in body structure.
- Prepare a seafood dinner using as many different products of the sea as possible.
- Obtain marine life eggs from pet shop or fish hatchery and hatch.
- Obtain hydra from local pet shop and observe the reproduction process.
- Process algae into food products such as meal for cookies.
- Have some local scuba divers collect water and plant life at different depths in a pond or lake and observe the differences.
- Make a fishing fly.
- Visit a pet shop that sells tropical fish and observe the various types of sea life.
- Visit a high school marine science program.
- Prepare and stock a clam bed.
- Plan and take a trip to observe activities in a fish hatchery.
- Plan and take a trip to observe activities in a sewage treatment plant.
- Identify small animals and plant life in a creek.
- Make plaster of paris prints of wild animals in the area and identify them.
- Visit a ship lock to determine activities performed by the employees.
- Make and identify a shell collection.

Hospitality and Recreation Cluster

- Plan a visit to a zoo or museum and observe the occupational activities of the personnel.
- Plan a visit to observe the commercial fisheries activities including: fishing, crabbing, oyster planting and/or digging, clamming, etc.
- Observe charter boat fishing at a pier and discuss the responsibilities with the crew members.
- Plan a layout for a trailer camp including water, lights, waste disposal, and the control of the natural resources. (Visit a park to study the above features.)

- Plan a layout for a community park including picnic tables, waste control, and control for the natural resources.
- Plan a ski slide in a designated area.
- Plan a script to use with the class for conducting a guided tour explaining the environmental features of a nature trail or area.
- Visit a golf course and observe the grounds maintenance activities performed by the employees.
- Study and/or observe the activities of a rodeo, horse, livestock, or dog show and list the occupations involved.
- Plan and role play, simulate, and/or conduct a queen selection contest for one or more of the following: watermelon, soybean, cotton, blueberry, peach, strawberry, etc.
- Plan and conduct a watermelon seed spitting contest with the class.
- Plan and conduct a frog jumping contest with the class.
- Plan and conduct a round robin tournament of horseshoe pitching with the class.
- Plan, demonstrate, and/or conduct a fly casting activity.

Equipment

Transparent hen demonstration
 incubator (1)
 Egg scales (1)
 Egg candler (1)
 Egg grader (1)
 Egg basket (1)
 Poultry brooder (1)(small)
 Poultry feeders (2)
 Veterinary thermometer (1)
 Electric animal shearing
 clippers (1)
 Animal cage (1)
 Ear notchers (1)
 Tattoo set (1)
 Animal grooming combs and
 brushes (1 each)
 Soil tube (1)
 Soil auger (1)
 Soil sieves (1 set)
 Soil testing kit (1)
 Soil sampling spade (1)
 Soil classes kit (1)
 Capillary soil water
 demonstration set (1)
 Rock collection kit (1)
 Land measure compass (1)
 Pocket area scale (1)
 Folding measuring land wheels (1)
 100-foot steel tape (1)
 Greenhouse (1)
 Soil sterilizer (1)
 Hoes (2)
 Garden rakes (2)
 Mattocks (2)
 Shovels (2)
 Axes (2)
 Pitch forks (2)
 Potato forks (2)
 Hole diggers (1)
 Hatchets (2)
 Leaf rakes (2)
 Wheelbarrow (1)
 Garden hose (100 ft. 1/2")
 Spray nozzle (1)
 Cyclone seeder (1)
 Long blade transplanting spade (1)
 Hydroponic kit (1)
 Long handled bulb planter (1)
 Seed flats (or lumber for
 construction)
 1 1/2 gallon capacity sprayer (1)
 Lopping shears (2)

Hand pruning shears (3)
 Hedge shears (1)
 Pruning
 Pole pruners (1)
 Pole saw (1)
 Bow saw (1)
 Horticulture hand tools (weeder,
 fork, rake, etc.) (1 set)
 Pruning knives (2)
 Budding and grafting knife (1)
 Grafting charts (1 set)
 Indoor Greenhouse (miniature)(1)
 Seed starter (1)
 Vegetable and crop grading
 equipment (1 each)
 Tree marking gun (1)
 Increment borer (for cross sections
 of trees) (1)
 Log rule (1)
 Log caliper (1)
 Log scale stick (4)
 Tree identification replicas(1 set)
 Insect net (1)
 Insect spreading board (1)
 Insect killing jars (1)
 Insect exhibit case (1)
 Bee hive (complete with frames)(1)
 Bees (3 lbs.)
 Bee veil (2)
 Hive tool (1)
 Bee smoker (1)
 Bee gloves (2 pairs)
 Glass observation hive (1)
 Terrarium (1)(gallon jugs may be used)
 Tin tub (1) (for worm rearing)
 Water testing sets or kits (1)
 Bioscope (1)
 Microscope (1)
 Sod edger (1) (hand or electric)
 Hand lawn mower (1)
 Roto tiller (1)
 Weighing scales (1)(60 lb. capacity)
 Angle spout oiler (1)
 Hammers (1 each)(Tinner's,
 machinist's, ball peen, etc.)
 Hand crosscut saw (1)
 Hand rip saw (1)
 Pliers (1 each)(electrician side
 cutting pliers, combination
 pliers, long chain needle nose
 pliers)
 Screwdrivers (3 each)(Phillips and
 regular)

Soldering copper (1)
 Coping saw (3)
 Hacksaw frame (2)
 Indoor thermometer (1)
 Wire strippers (1)
 Magnetic compasses (2)
 Outdoor thermometer (1)
 Rain gauge (1)
 First aid emergency kit (1)
 Fire extinguisher (1)
 Eye goggles (for each student for
 largest class)
 Fiberglass safety hats (2)
 C-clamps (2)
 Bar clamps (2)
 Hand screw (2)
 End cutting nippers (1)
 Zig zag rule (4)
 Flexible steel tape - 10 ft. (4)
 Steel square (2)
 Try square (2)
 Planes (1 block and 1 jack)
 Wrecking bar (1)
 Tin snips (2)
 Staple gun (1) (builders)
 Glass cutters (2)
 Punches - nail (3)
 Pipe wrenches (1 each-6", 8", 12",
 and 15")
 Compass (2)
 Open end wrenches (1 set)
 Allen wrench set (1)
 Extension cords (2- 25 each - heavy
 gauge)
 3-way adapters (3) (Electrical)
 Hot plate (1)
 Charts, mounts, models, specimen,
 materials, exhibits, etc. (1 each
 for clusters in this lab)

*Materials (considered as consumable)

Eggs (assorted grades - 3 dozen)
 Soil sampling boxes (free from County
 Extension Chairmen)
 Soil testing replacement materials
 Clean building sand
 Peat moss
 Potting soil
 Top soil
 Germinator pads
 Germination blotters
 Hydroponic replacement materials

Screen - different mesh
 Hardware cloth - different mesh
 Plant labels and markers
 Bulbs (plant)
 Insect spray
 Insecticides
 Grass seeds (different varieties)
 Crop and horticulture seed
 (different varieties)
 Vegetable and horticulture plants
 (different varieties)
 Plastic
 *Shrubs and trees (different varieties)
 Tree wound dressing
 Jiffy 7 peat pellets
 Jiffy 7 peat pots
 Grafting wax and supplies
 Rootone (Root growth hormone)
 Hanging plant baskets
 Flower pots
 Burlap (for bagging and balling
 shrubs)
 Pinning nails (for bagging and
 balling shrubs)
 Fertilizer
 Lime
 Wildlife and forestry plants, trees,
 and seed
 Tree paint (yellow)
 Paper bags
 Food ingredients for bird feeders
 Worms for preparing worm growing
 projects
 Crickets for preparing cricket
 raising projects
 Ethylene acetate (for insect
 killing jars)
 Foundation wax
 Manilla rope
 Whipping line
 Plastic line
 Chain or cable
 Rat poison
 Soap detergents (different brands)
 Solder
 Oxocetylene tanks (small)
 Sandpaper
 Steel wool
 Emery cloth
 Wire scratch brush
 Exterior plywood
 Interior plywood
 Miscellaneous lumber

Miscellaneous treated lumber
 Bricks
 Concrete blocks
 Casting plastic
 Plaster, casting
 Test tubes
 Motor Oil
 Nails - assorted
 Corrugated (fasteners)
 Screws - assorted (sheet metal and wood)
 Gasoline
 Paints
 Soil sterilization materials
 Tin Metal and wood finishes
 First aid supplies
 Hacksaw blades
 Cassette tapes
 Transparency materials
 Magic Markers
 Batteries for cassette players
 Tape: masking, scotch, etc.
 Staples
 Glue
 Microscopic slides and slide materials

*Consumable supplies should be purchased in quantities which are reasonable in relation to student enrollment and for instructional purposes only.

Audio Visuals

Overhead projector
 Filmstrip projector
 Record player
 35 mm projector (slides)
 Projection screen
 16 mm projector
 8 mm closed loop projector
 Projector stand (cart)
 Cassette player
 Flannel board
 Visuals appropriate for clusters in the environmental occupational laboratory
 Other
 Bioscopic visuals related to clusters in this lab
 Microscopic visuals related to clusters in this lab

APPENDIX D

INDUSTRIAL OCCUPATIONS

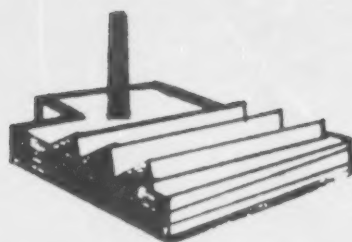
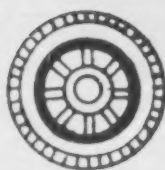
INDUSTRIAL OCCUPATIONS LABORATORY

Facilities

Equipment

Materials

Activities



INDUSTRIAL OCCUPATIONS

The Industrial Occupations Laboratory is a comprehensive facility in which cluster areas such as construction, manufacturing, communication, fine arts, public service, and transportation are explored. Some activities related to the various clusters could also be conducted outside the building or even in the community.

Because of the nature of the activities and the equipment used in this facility, it is probably one of the most hazardous of all laboratories. A safety education program is therefore essential in managing this particular lab.

Provision should be made to use the equipment with as many of the cluster areas as feasible. For instance, manufacturing could be explored in the metals area as well as the wood area or a combination of the two is practical. Activities related to stage props could be constructed in the wood area also. Equipment in the Industrial Occupations Lab is supportive for providing individuals with experiences in the cluster areas previously identified. Where possible, and dependent upon individual expertise of the staff, other cluster activities may be performed in the Industrial Occupations Lab. The co-ordinator of the laboratory, however, is the main one who can make the experiences meaningful; therefore, when selecting the equipment, materials, and activities measure them in terms of the following criteria

An affirmative response to one or more should be answerable when applied:

1. The activity simulates the performance of a typical job task.
2. The activity simulates the skills that may be developed in high school offerings
3. The activity provides occupational information.
4. The activity provides an opportunity for students to appraise themselves in relation to present and future educational opportunities as well as to jobs in the world of work.

Included on the following pages is a suggested prototype of LAPS, floor plan, equipment and materials

One should keep in mind that a prototype is merely a model or example. In this case the term "prototype" is used to mean a basic format. THERE ARE OTHER FORMATS JUST AS USEFUL. Keep in mind also that the prototype Learning Activity Package (LAP) is one suggested method and format. Learning Activity Package refers to a unit of instruction utilizing many and varied activities (field trip, written assignment, manipulative assignment, game, film review, role playing, etc.). The package should provide for a variety of experiences related of course to occupational information and self-appraisal. One should not feel tied to one basic format.

Teacher Information Sheet
(Orients the Teacher to
What, Where, How)

PROTOTYPE

- ACTIVITY:** Learning about and performing the task of a carpenter
(Place the appropriate activity title)
- CLUSTER:** Construction (Place the appropriate activity title)
- PURPOSE:** Students will examine the role of a carpenter (rewards, frustrations, duties, etc.) and explore some of the activities he performs.
- APPROACH:** The learning package is individualized, student-centered. It relies on the student to progress at his rate of speed and frees the teacher as a resource person/manager for the other clusters operating concurrently. Some activities should be performed by all students, and additional activities within the packet should be provided as optional. A good LAP will include activities that provide self-appraisal, career information, and close simulation of job task. NOTE: Although reading skills are important, instructions may be placed on cassette tapes to assist slow readers.
- EQUIPMENT & MATERIALS** Listed should be appropriate items and materials to be used in the activities (e.g. this cluster:) - Occupational Handbook, "Symbols the Carpenter Uses" - handout: "Building a Wall" - operation sheet, hammers (3), saws (2), nails (1 lb.), squares (3), zig-zag rules (3), chalkline (1).
- EVALUATION:** Specific knowledge or skills is not the aim of the activities. Exploration related to job simulation is the goal; therefore, evaluation does not result in a grade (A, B, C, etc.). Evaluation is devised so as to assess student's like or dislike, ability, interest, (self-appraisal). Failure in an activity might mean success. (It was successful to the student in that he or she learned they did not enjoy the occupation or did not possess potential there.) Evaluation must be realistic and related. (e.g. in this cluster:)
1. What does a carpenter do?
 2. What skills does he have to have?
 3. Does he ever become frustrated? If so, how?

PROTOTYPE

LEARNING ACTIVITY PACKET

CLUSTER: Construction

OCCUPATION: Carpenter

ACTIVITY: Learning about and performing task of a carpenter

INSTRUCTIONS: Complete activities 1, 2, and the evaluation. Activities 3 & 4 are optional if you wish to explore the carpenter's duties further.

INTRODUCTION: The carpenter's duties are many. He must have a knowledge of the variety of materials, processes, tools, and equipment. Often he makes drawers, hangs doors, installs windows. Not only must he have a knowledge of these things, but he must also be skilled in using them. Through the activities below see what you can learn about the carpenter.

- Activity #1 Visit a carpenter or house site and ask the carpenter to show you a floor joist, stud, rafter, corner post. Ask him to show and tell you why they are needed.
- Activity #2 Get an "operation sheet" from your instructor. Follow the instructions on the sheet to develop a wall section.
- Activity #3 Obtain a copy of "Symbols the Carpenter Needs to Know" from your instructor. Using these accepted symbols draw a "rough stick" sketch of a house plan a carpenter might use.
- Activity #4 Determine the number of 4 x 8 sheets of exterior plywood needed to cover the sides of the building below.

APPRAISAL

1. Are there schools that train carpenters?
2. Do carpenters take on and train apprentices?
3. List some tools a carpenter uses.
4. Do carpenters belong to a union?
5. Identify these terms as a carpenter would use them:

Tolerance

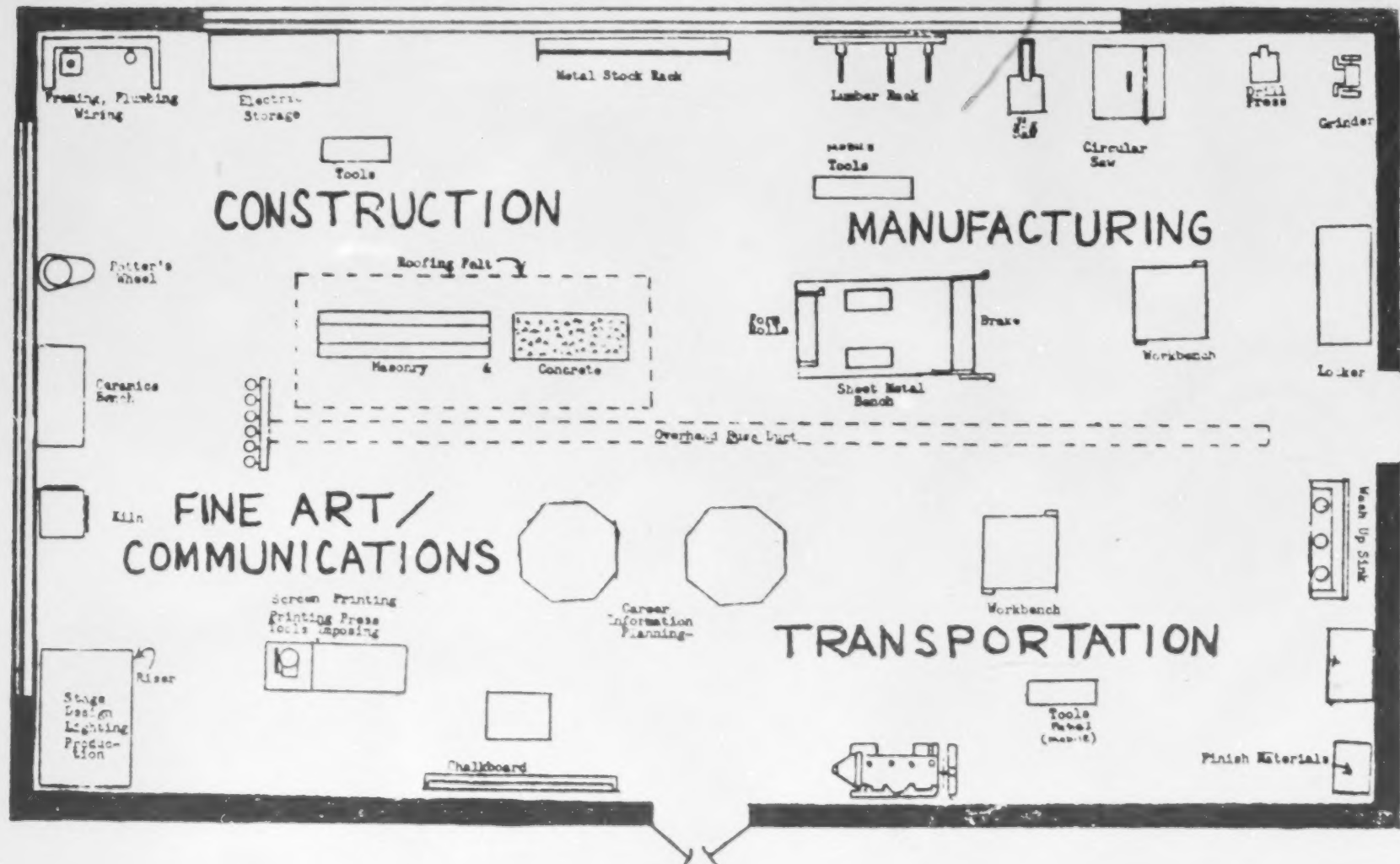
Plumb

True

Square

6. Does a carpenter ever become frustrated? How or why?
7. Do you feel you would like to be a carpenter? Why or why not?
8. Would you like to learn more of the skills a carpenter must have? List specific skills you wish to know.

INDUSTRIAL OCCUPATIONS LABORATORY



SUGGESTED EQUIPMENT LIST

Please note that the items listed below are suggested items. Note also that quantities have been indicated.

Manufacturing & Construction

Mobile Tool Cart Hand Items

- 1 Jig Saw Vibrating
- 30 Jig Saw Blades
- 1 Electric Drill
- 1 Saber Saw
- 24 Saber Saw Blades
- 24 Coping Saw Blades
- 3 Hack Saw Blades
- 3 Scratch Awls
- 2 8" Adjustable Wrenches
- 2 Nail Sets
- 1 Center Punch
- 2 Vise Grip Pliers
- 2 Countersinks
- 2 Trimming Knives
- 2 Sloyd Knives
- 1 Wire Brush
- 5 24" Steel Bench Rules
- 2 12' Push-Pull Tape Measures
- 5 13 oz. Hammers
- 5 Zig-Zag (Folding) Rules 8'
- 2 Compound Lever Snips
- 2 Trimmer Shears
- 1 Trammel Point Set
- 7 File with Handles (8")
- 2 File Cards
- 4 8" Try Squares
- 5 Screwdrivers (Assorted Sizes)
- 2 10" Braces
- 2 8" Surform Planes
- 2 Block Planes
- 5 Hand Saws (Cross-cut)
- 3 Back Saws
- 2 Wood Chisel Sets $\frac{1}{4}$ " - 1"
- 1 Expansion Bit
- 2 Drill (Twist) Bit $\frac{1}{16}$ " - $\frac{7}{8}$ "
- 5 Assorted Size Auger Bits
- 1 Revolving Hand Punch
- 1 Oilstone Combination 6 x 2 x 1
- 2 Sets Taps and Dies
- 5 Trowels London 5" x 12"
- 3 Coping Saws

- 2 6" Spacing Rules
- 2 24" Spirit Levels
- 4 Corner Blocks (Masonry)
- 5 Brick Hammers
- 1 Chalkline
- 2 Jointers $\frac{3}{8}$ " x $\frac{1}{2}$ "
- 3 Plastering Trowels 11" x 4- $\frac{3}{4}$ "
- 2 Utility Brushes
- 2 Buckets (8 qt.) 10- $\frac{1}{8}$ " Dia.
- 1 Water Hose (25 ft.)
- 1 Mortar Hoe
- 2 Conduit Benders
- 2 Pop Rivet Guns
- 4 Wire Strippers $\frac{8}{16}$ "
- 2 Armored Cable Cutters
- 4 Fusible Main Serv. Boxes
- 4 $\frac{1}{2}$ " Deep 4" Octagon Boxes
- 4 Switch Boxes
- 4 Toggle Switches
- 4 Duplex Flush Receptacles
- 4 Electrician $\frac{9}{16}$ " Pliers
- 4 Needle Nose 6" Pliers
- 2 Electrician Tool Pouches

Transportation Mobile Cart Items

- 1 13-Piece Socket Set $\frac{3}{8}$ " to $\frac{3}{4}$ "
- 1 1- $\frac{1}{8}$ " Socket
- 1 1" Socket
- 1 $\frac{13}{16}$ " Socket
- 1 Set Combination Wrenches $\frac{1}{4}$ " to 1- $\frac{1}{16}$ "
- 2 Mechanics Stethoscopes
- 1 Self-Calculating Anti-Freeze Testor
- 1 Battery Brush Cleaner
- 1 Small Motor Tool Panel of Assorted Tools
- 1 Fly Wheel Pullers
- 1 Pourspout
- 1 Battery Filler
- 1 Set Allen Wrenches
- 1 Compression Tester
- 2 Spark Plug Adjusting Tools

CommunicationMobile Unit of Equipment

- 2 California Job Cases Filled with
8 point Bodoni
- 3 6" Stainless Steel Composing Sticks
- 2 10" Stainless Steel Composing Sticks
- 3 12" Stainless Steel Line Gauges
- 5 Galleys
- 1 Pilot Press
- 1 Proof Press

Equipment

- 2 Orbital Sander
- 1 Circular Saw 10"
- 1 Scroll Saw
- 1 Comprehensive Sheet Metal Equipment Bench
(Brake, Shear, Bender, Notches, Roller)
- 1 Drill Press
- 1 Grinder 7"
- 3 Drawing Boards 20" x 24"
- 3 Triangles 30° x 60°
- 3 Drawing Instrument Sets
- 25 Safety Glasses and other devices required
by State Law

SUGGESTED MATERIALS LIST
INDUSTRIAL LABORATORY

- 4 Gal. Latex Paint (Instructor Choice)
- 3 Gal. Turpentine
- 1 Doz. Spray Lacquer (Clear)
- 1 Doz. Spray Lacquer (Two colors of choice)
- 3 Gal. Brushing Lacquer
- 5 Gal. Lacquer Thinner
- 6 Qts. Oil Stain (Instructor's choice)
- 5 Pint Cans of Wood Filler
- 1 Doz. 1" Brushes
- 1 Doz. 2" Brushes
- 4 Boxes Assorted Flathead Screws
- 4 Boxes Assorted Nuts & Bolts
- 4 Boxes Assorted Sheet Metal Screws
- 6 Boxes of Coping Saw Blades
- 1 50 lb. Carton #8 Nails
- 1 50 lb. Carton #16 Nails
- 1 5 lb. Box Roof Nails
- 4 Boxes $\frac{1}{2}$ " x 18" Gage Brads
- 4 Boxes 1" x 18" Gage Brads
- 2 5 lb. Boxes 8d Finishing Nails
- 2 Boxes Scroll Saw Blades
- 1 Box of Hack Saw Blades
- 2 Boxes 1/8" Pop Rivets
- 1 Pop Rivet Gun

* Note: All items based on 1 year of operation

- 2 2/0 Garnet Paper (100 per box)
- 3 6/0 Garnet Paper
- 3 8/0 Garnet Paper
- 3 Fine Emery Cloths
- 3 Medium Emery Cloths
- 3 Gallon White Glue
- 2 Gallon Contact Cement

Quantities will be dependent upon activities planned by instructor

Need 2" x 4"'s; 2" x 6" 's for construction as well as plywood for flooring and roofing.

Other Construction Manufacturing Items

Sand	Mortar
Brick	Lime
Cement	Concrete
Sheet Metal	Wiring

Communication/Fine Art

Quantities also dependent upon activities planned by instructor

Inks
Papers
Solvents

INDUSTRIAL LABORATORY

Clusters Explored in the Industrial Laboratory

- . Construction
- . Communications & Media
- . Fine Arts
- . Manufacturing
- . Transportation
- . Public Service

Suggested Activities - Note: In recommending activities be certain to relate each activity to a specific occupation. It should simulate a real world of work situation as nearly as possible.

Construction:

- . Test soil for foundation analysis
- . Plan and develop a model of a community
- . Design a building (employing wood, clay, styrofoam, sketches, detailed drawings, etc.)
- . Prepare a working drawing for a project
- . Prepare specifications for a building project - make estimates
- . Make bids on building projects from specifications and estimates
- . Using a topography box with dirt or sand, clear, grade and prepare a site for construction
- . Make a form for pouring concrete
- . Mix and place concrete
- . Lay three or more courses of brick
- . Decorate an interior panel or feature
- . Decorate an exterior panel or feature
- . Build a model of a bridge, road, or dam
- . Landscape a plot or area either at school or home
- . Design and make a model of a recreation facility
- . Paint or wallpaper a wall section
- . Hang a door and install hardware
- . Conduct a personnel mediation and arbitration session pertaining to labor dispute
- . Measure and lay out and cut a common rafter
- . Wire from a source of power through a switch to a light, receptacle, etc.
- . Install plumbing fixture, pipe, etc.
- . Experience activities that involve shaping, forming, abrading, grinding, filing, cutting, etc., on a variety of building materials
- . Frame a wall section
- . Lay out monument board locating site marker
- . Surveying and mapping using topography box and grid chart
- . Cut pipe threads
- . Lay two courses of roofing on a piece of plywood

Communications:

- . Take photograph, develop film, prepare for half-toning and ultimate, printing
- . Operate an offset press or duplicator
- . Prepare a master for above
- . Make personalized note pad - using all essential processes
- . Rebind a book
- . Splice wire - western union, tap or branch, pigtail
- . Take a group photograph of the class, develop negative, make enlargements and several contact prints
- . Take a photograph of an unusual scene - develop and print
- . Set type - your name, address, etc., for your personal card in a composing stick
- . Justify type - proof, lock, prepare, make ready and print 50 cards on letter press
- . Make a radio from kit
- . Transmit and receive message using morse code key and buzzer
- . Make an original design and transfer to linoleum block for block printing
- . Make your own Christmas cards using silkscreen, block print, or other appropriate processes
- . Design class or school emblem to silkscreen on student's teeshirts
- . Make a telephone directory of class members and print for each student
- . Prepare a five minute newscast including commercials
- . Make a transparency
- . Run a projector
- . Make an electro magnet
- . Wire series and parallel circuits
- . Generate electricity with motion
- . Control electricity from power source through switches
- . Make a telegraph key
- . Make models or experiment with various means of communications - highway signs and signals, radio signals, relays, switches, heat signals, light signals, etc.

Fine Arts:

- . Make scenery, costume, and other essentials for a production
- . Design and make a sculpture from raw materials
- . Make textile designs using a loom
- . Screen print
- . Make a color wheel
- . Use potter's wheel
- . Slip cast a product
- . Make ceramic product using clay-slab, coil, pinch, etc.
- . Paint scenes, portraits, etc., using water color acrylics, oils, etc.
- . Make an art layout for a product
- . Design a package for a product

Manufacturing:

- . Design a practical useful product
- . Make a model or prototype of the designed product
- . Make a bill of materials for the product
- . Make a flow chart showing the operations of a product from raw materials to marketing and distribution
- . Plan an operation requiring interchanging of two or more parts
- . Do a single operation or job for 20 minutes without doing anything else
- . Experience activities involving abrading, shaping, forming, grinding, assembling, cutting, drilling, boring, layout, milling, etc.
- . Make a jig or fixture that would require a multiple production operation
- . Design and make a cardboard box for packaging a particular object
- . Route packaged materials from the production line to a destination (simulated)
- . Make an organization flow chart of a manufacturing firm
- . Make a job specification for the following personnel: line production, shipper, foreman, quality control, purchaser
- . Calculate the cost of a product (manufacturing price)
- . Make a template
- . Prepare a "tooling-up" procedure or process
- . Design and make a useful product for the home. Make a survey of the product and determine its worth for production
- . Sell stock certificates on a manufactured product and determine dividends to share holders
- . Make an object in which two pieces fit together and each piece made by a different group
- . Prepare an advertisement for a product
- . Make a casting of an object - plastic, metal, plaster, etc.
- . Make an apparel requiring matching or coordinating features
- . Make a three dimensional model
- . Make a production prototype
- . Design a flow chart for a product that would be manufactured by automation
- . Make an organization chart of personnel in a factory

Transportation: (Role playing would be a good strategy for presenting this cluster. e.g. Service Station Attendant, Auto Mechanic Technician, Tire Recapper)

- . Disassemble and clean and reassemble small engine
- . Check the gap of spark plug on a small engine
- . Look under the hood of an automobile - identify 2 barrel and 4 barrel carburetors
- . Identify alternator, etc.
- . Drain and replace anti-freeze - check specific gravity
- . Check tire pressure with air gauge
- . Check battery

- . Disassemble, examine, and reassemble automotive speedometer
- . Send and receive a message using railroad telegraph key
- . Make a planetarium with shoe box, lights, etc
- . Make a telescope
- . Build a model of all means of transportation
- . Design and play a transportation game similar to monopoly
- . Make a travel brochure relative to
 - A. A country you would like to visit
 - B. A means of transportation you would like to use
 - C. A cruise to the Carribean
- . Disassemble an auto engine, transmission or rear end
- . Make a conveyor belt
- . Make items using mechanical advantage applicable to transportation - wheel and axle, gear, etc.

Public Service - (Role Playing is a good strategy in simulating world of work situations in this cluster)

- . Have firemen come to the school and demonstrate fire-fighting equipment and describe the services of the fire department
- . Prepare quantities of mailing pieces and route them through the proper channels (simulated or actually in community)
- . Organize a fund raising campaign
- . Construct working models of weather instruments and compare reporting of weather bureau
- . Invite state and local government to discuss public services
- . Determine the community's most dangerous highway safety hazard and make a study of how this hazard can be eliminated. Make a model of how it is and make suggested changes.
- . Plan a procedure in case of a national emergency
- . Select an area in school that one will be responsible for its maintenance and up-keep
- . Inspect the cafeteria for health conditions
- . Inspect the school for fire and safety hazards and make suggestions to eliminate same
- . Plan a political or civic election procedure
- . Give a 5 minute demonstration on a related unit of study
- . Plan a procedure for funding a research project in the community
- . Plan a procedure for pursuing a thief who has robbed a local bank
- . Make an identification plate for an article or a bicycle
- . Make fingerprints for identification
- . Plan and make a recreation apparatus for the city/county recreation program
- . Draw plans for a county park with a lake, camping facilities, playground, hiking trails, zoo, exhibits, etc.
- . Plan an alternate route around a community
- . Make a game to give to a local delinquent institute or hospital
- . Work with someone who has been released from a correction center to help him adjust to school
- . Prepare aids for attracting reading in the library

APPENDIX E

SERVICE OCCUPATIONS

Service Occupations Exploratory Lab

The clusters included in the Service Laboratory are: Consumer and Homemaking, Health Occupations, Hospitality and Recreation Occupations, Personal Service Occupations, and Public Service Occupations; however, the qualifications of local personnel should dictate the clusters within a specific laboratory.

In the following pages are suggested learning and evaluation activities, equipment and material lists, and a floor plan. These may serve as a guide in planning, executing, and evaluating the activities within this laboratory. However, it is felt that these should be supplemented, revised, and expanded so as to meet the specific exploratory needs of your students. All activities should provide occupational information which allows the student to understand field and level relationships (Career Ladder Concept). This approach will allow students to see job opportunities from the unskilled level to the professional level, thus providing a decision-making process (e.g. Housekeeper - Household Products Technician - Home Service Director; Seamstress - Sewing Instructor - Fashion Designer; Cook - Plant Hostess - Research Nutritionist, etc.).

A prototype demonstrating one way to develop a "suggested learning activity" into a series of meaningful classroom/laboratory experiences is on the following pages. In this case the term "prototype" is used to mean a basic format. There are other formats just as useful. Regardless of the format one chooses, certain criteria should be included if the exploratory activity is to be meaningful. An attempt has been made to call your attention to the criteria by using the blocks to the left of the pages of the prototype. The criteria includes: (1) the generalizations or ideas the students are expected to receive from the activity, (2) the purpose of the activity, (3) explanation or why explore the activity, (4) continuity in activities, (5) continuous evaluation, (6) concise student directions, (7) occupational information.

A variety of other teaching strategies (e.g. skits, debates, small group discussions, oral reports, field trips, roleplaying, puzzle assembly, resource persons, occupational games, demonstrations, radio and TV programs, panel discussions, lectures, audiovisual input, and brainstorming) lend themselves to the exploration program. It will be the responsibility of the teacher to develop the ideas into appropriate instruction.

Students must be properly prepared prior to participating in each laboratory activity and must also be provided with meaningful follow-up experiences.

The process for selecting exploratory activities as outlined below should be followed:

1. The activity simulates the performance of a typical job task.
2. The activity simulates the skills that may be developed in high school occupational offerings.
3. The activity provides occupational information.
4. The activity provides an opportunity for students to appraise themselves in relation to present and future educational opportunities as well as to jobs in the world of work.

One or more affirmative responses must be derived when the process is applied to a prospective exploratory activity.

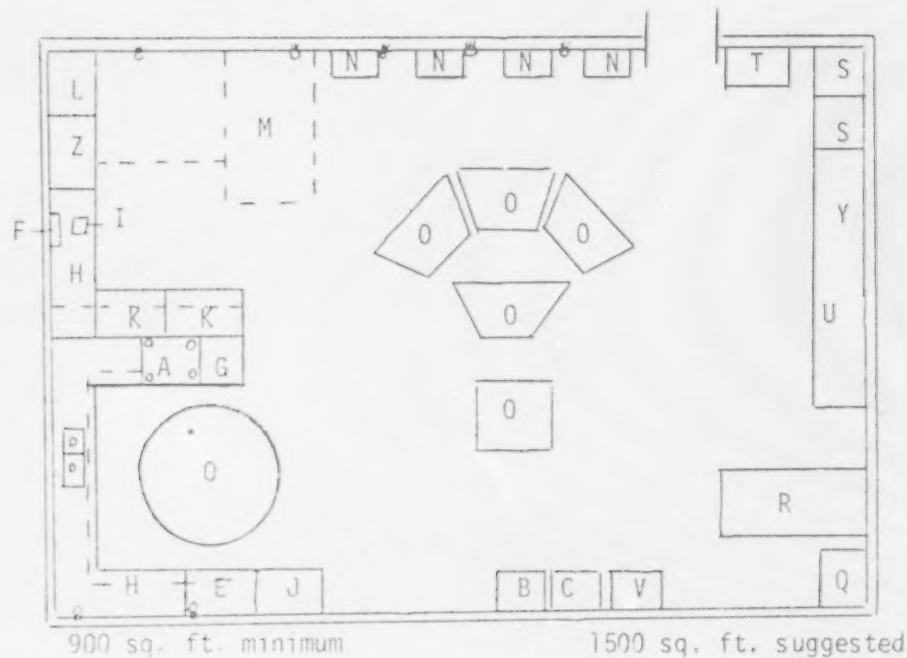
Even though the grade level is not indicated for specific activities in the outline of sample learning and evaluation activities, it would be advisable for the teacher to follow a sequential pattern. When specific activities are explored at the initial grade level, they should not be repeated at the next or any following grade level.

Equal time should be allotted to each of the clusters included in the Service Laboratory. This can easily be done when laboratory activities in each cluster are going on simultaneously and all students rotate to a new cluster at the same time.

The overall budget will need to include monies for consumable items. However, the teacher needs to be cautious of overbuying. (e.g. purchase food and other items only the amounts necessary for the student to grasp the concepts of the specific activity.)

The floor plan suggests ways you can re-arrange and utilize your existing physical facilities to best advantage.

SERVICE OCCUPATIONS LABORATORY



- A = Range (1) (Electric) 30"x24"x32"
- B = Automatic Washer (1) (optional)
- C = Electric Dryer (1) (vented)
- D = Sink (Kitchen) (1) 30" double bowl
- E = Refrigerator/Freezer (1) 16 cu. ft.
- F = Mirror (over lavatory) (1)
- G = Cutting board 18"x24" (1)
- H = Formica counter tops
- I = Lavatory sink 18"x18" (1)
- J = Cleaning closet 36"x24"x84" (1)
- K = Tote tray base cabinet (2)
- L = Garment storage 36"x24"x84" (1)
- M = Ironing area
- N = Sewing machines (4)
- O = Trapezoidal tables (4) 30"x30"x30"x60"
(1) round 48" diameter; (1) sq. 36"x36"
(Allows flexible arrangement)

- P = Teacher's desk (1)
- Q = Night table (1) (optional)
- R = Hospital bed (1) (optional)
- S = Resource carrels (2)
- T = Bookcase (min. 4 linear ft.)
- U = Shelves
- V = Base cabinet (1)
- W = Dishwasher (1) (optional)
- X = Chalkboard (maximum 4')
- Y = Bulletin board (8-10')
- Z = Base shelf storage 36"x24"x37"
Chairs (plastic molded, variety
of colors) (16)

SERVICE LABORATORY

CONSUMER & HOMEMAKING
HEALTH OCCUPATIONS

PUBLIC SERVICE

PERSONAL SERVICES
HOSPITALITY & RECREATION

LIST OF SUGGESTED MATERIALS

Small Electric Appliances

Blender (1)
Mixer (1)
Can Opener (1)
Automatic Coffeemaker (1)
Fry Pan (skillet) (1)
Toaster (1)
Waffle Baker/Grill (1)
Buffet Range (hot plate) (1)

Kitchen Equipment

Fry pan or skillet (1)
Saucepans (1 1/2 qt. & 2 qt.)
Double Boiler (1)
Cookie sheets (2)
Square pan (8"x8") (1)
Cooling racks (2)
Candy thermometer (1)
Pastry brush (1)
Rubber spatulas (2)
Sifter (1)
Egg beater (1)
Cutlery set (1)
Wooden spoon (1)
Paring knives (2)
Rolling pin (1)
Tongs (1)
Cookie press (1)
Measuring spoons (2 sets)
Liquid measuring cups (2)
Dry measuring cups (2 sets)
Refrigerator dishes (3 or 4)
Collander (1)
Ice bucket (1)
Cannister set (1)
Placemats (4-6)
Dinnerware)
Silverware) Service for 4-6
Glassware)
Salt & pepper shakers (1 set)
Sugar & creamer (1 set)
Punch bowl & ladle (1)
Punch cups (16-20)
Sandwich tray (1)
Oval serving tray (1)
Dish drainer (1)
Dish cloths & towels (10)

Other Materials

Gloryhead or wigstand & wigs (1 or 2)
Comb & brush (1)
Rollers & hair clips (10)
Hand mirror (1)
Hair dryer (1)
Make-up kit (1)
Manicure kit (1)
Styling comb (1)
Cutting board - (Dressmaker) (1)
Straight pins (1 box)
Needles (variety of sizes)
Scissors or shears (2-3)
Tape measure (2-3)
Yardstick (1)
Hem marker (1)
Ironing board (1)
Steam iron (1)

Health Materials

- *Hospital bed (optional) (1)
- Microscope (optional) may be borrowed from another department in school (1)
- Screen, folding (optional) (1)
- Table, overbed (optional) (1)
- Nightstand (optional) (1)
- Blanket - needed if hospital bed is available (1)
- Sheets (2)
- Pillow (1)
- Pillowcases (2)
- Towels and washcloths (2)
- Patient's gown (1)
- File chart (1)
- Thermometer (oral) (2 or 3)
- Stethoscope (optional) (1)
- Ice bag (1)
- First-aid kit (1)
- Bandages
- Scales, health meter (may use one available elsewhere in school) (1)
- Snellen chart (1)

Miscellaneous Materials

- Sponge mop (1)
- Vacuum cleaner (1)
- Brooms (2)
- Dust pan (1)
- Cleaning supplies
- Pliers (1)
- Screwdriver (1)
- Hammer (1)
- Wire cutters (1)
- Film strips
- Cassette tapes
- Slides
- Loops
- Filmstrip projector (1)
- Filmstrip previewer (1)
- Cassette player (2)
- Film loop projector (1)
- Head sets (4)
- Independent study auto vance (1)

If the Occupational Information Center is available, these may be housed there. However, there is a need for them in each laboratory.

Occupational Outlook Handbook (1)

Dictionary of Occupational Titles (1 set)

Periodicals suited to grade level (Ex.: Today's Health, Changing Times)

BUDGET NEEDED FOR CONSUMABLE ITEMS: The overall budget will need to include monies for consumable items. However, the teacher needs to be cautious of overbuying (e.g. purchase food or other items only in the amounts necessary for the students to grasp the occupational concepts of the specific activity). Large quantities of food buying as in a traditional foods class is discouraged.

*if equipment funds are limited, a variety of less expensive equipment may be advisable.

CRITERIA

PROTOTYPE

I want my students to be able to demonstrate verbally or in writing these or similar generalizations or ideas:

- .People can't afford to buy everything they want at the time they want it.
- .Money is used by everybody in a family and everybody must decide what he must have now before we buy things that might not be essential.
- .Sometimes we get sick, have an accident, etc., and we need more money than we earn that week or month - how can we pay for things we must have in an emergency?

ACTIVITY: "Steps in Making Consumer Decisions"

CLUSTER: CONSUMER AND HOMEMAKING EDUCATION

Is the purpose consistent with the generalizations I want my students to get? Will my students need to explore financial decision-making experiences as homemakers and consumers in order to be able to form the above generalizations?

PURPOSE: Students will explore the financial decision-making process of being homemakers and consumers.

If all of my students aren't good readers, what provisions will I make for the others?

APPROACH: This learning package is designed to be used by students with a minimum of help from the teacher. Poor readers may need help in reading the instructions.

What are my expectations from all students? How are the needs met of those students whose interests and abilities extend beyond the group?

All students should complete the introduction, preview, Activities 1-3 and review sections.

Activities 4 and 5 are optional for those students whose abilities extend beyond those of the group. In addition, the teacher may wish to suggest additional filmstrips, reading references, or other resources.

What materials and equipment do I need to provide for my students in order for them to carry out this activity?

EQUIP. & MATERIALS Table and chairs
Teen Guide to Homemaking
Several family descriptions
Pictures of items to support family descriptions

What do I evaluate?

Why evaluate?

EVALUATION: Exploratory activities are not to be graded, but student progress is to be evaluated continuously. Specific knowledge or skill related to the performance of a job is not expected to occur. However, the teacher will want to provide adequate guidance based on an informal evaluation of how the students are progressing in understanding the nature of the work, the skills, attitudes and values that must be developed by workers in order to sequence future learning activities. The informal evaluation will also suggest the development of additional learning activities and teaching materials.

LEARNING ACTIVITY PACKAGE

CLUSTER: Consumer & Homemaking Education Occupations

OCCUPATION: Homemaker

ACTIVITY: Steps in Making Consumer Decisions

Does this give the students overall directions for completing this LAP?

INSTRUCTIONS: You are to complete Activities 1, 2 & 3. You may complete Activities 4 and 5 if you wish.

Does this convey the ideas I want the students to get when doing the activities?

INTRODUCTION: The occupation of a homemaker is a very important one that includes many responsibilities. Each member of the family is a homemaker. An important job of a homemaker is to learn to use money, time and energy wisely. A person who uses their talent, time, money, and energy to secure things is called a "consumer." A consumer pays for things that are necessities first and then decides how he will secure other things he wants.

Will this preview help the student to measure his ability to make wise consumer decisions at this period of time? Will his individual values be reflected?

PREVIEW: Are you a wise consumer? One who can justify how money is used? Assume you are a homemaker earning \$400 monthly (\$100 weekly) take home pay, what things would you pay for first? List in the left hand column below:

There are some things we would like to have after the essentials are paid for, thus we need to make additional consumer decisions.

ACTIVITY 1: Organize as a member of a group of 4. Role-play the financial decision-making situation described below. Each member of the group will assume a family role. Stop the action after all persons have stated their case as to how he feels the money should be best spent and continue with Activity 2.

Does the activity require the students to make decisions? Is making consumer decisions the purpose of the overall activity?

SETTING: The family is gathered around the kitchen table. The father announces that he has \$16.00 left over from his paycheck and the family must decide how to use it. Each person has an item they would like to buy.

Father: wants to buy a new golf bag to replace ol one.

Mother: wants to buy a portable electric mixer because her old one cannot be repaired.

Daughter: wants a new pair of pants to wear on a date.

Son: wants a new baseball glove because he is a new member of the school team.

Will this be a fun-type activity for some of my students - yet will they see the relationship to the consumer decisions?

ACTIVITY 4: If you enjoyed the roleplaying about making financial decisions, you may find it fun to complete the sentences in the poem below. Fill in the blanks in every other line by choosing a word that rhymes with the last word of the previous line

Consumer Clues

Managing money wisely can be a real concern,
Especially for consumers who have much to _____
Cathy Consumer needs help, she does indeed, _____
In order to tell a want from a _____
All the clothes she sees, she wants to own, _____
If she used her resources with a little more care,
Then her wallet would not be quite so _____
It seems as if Cathy never learns _____
To save some of the money that she _____
She seldom figures what she must owe, _____
Until her account is extremely _____
If Cathy would save a little each week,
The end of the month wouldn't be so _____
But because she spends almost every penny,
Her money is gone, and she doesn't have _____
Cathy could make her money behave, _____
If only she would learn to _____
Let's help Cathy with a few _____
Other things that she might _____
Although she may find it a terrible bore,
She could compare goods from store to _____
Cathy is attracted by gimmicks and gags, _____
But she should take time to study the _____
When bills are due, instead of ranting and raging,
She could have planned for them by systematic _____

With our help, Let's hope Cathy has learned,
So as a consumer, she'll no longer be _____

"Puzzle Poems," What's New in Home Economics,
XXXVI (September, 1972), p. 28.

Will this occupational information show my students the relationship in the activities they have performed in this prototype and the performance of employees?

ACTIVITY 5: If you think you would like to help people, in addition to your family in making consumer decisions, you may enjoy reading about occupations in this area.

Consumer service representative, Teen Guide to Homemaking, p. 220.

Personal shopper, Teen Guide to Homemaking, p. 227

Home extension aide, Teen Guide to Homemaking, p. 229.

Consumer and Homemaking Cluster

Suggested Outline for Consumer and Homemaking in Occupational Exploration in the Middle Grade

I. The Intrinsic Value of a Homemaker to the Family Unit

A. Sample Learning and Evaluation Activities

1. Dramatize a situation that shows the importance of desirable role interaction of family members.
2. View selected cartoons which illustrate responsibilities of different family members.
3. Make a collage illustrating the responsibilities of homemakers (wife or mother, husband or father).
4. Invite a panel of people consisting of homemakers and students to discuss the expected responsibilities of homemakers in caring for the home and family.
5. For one week keep a "picture diary" of roles you witness being performed by a homemaker as she and/or he cares for the family. (e.g. Use discarded magazines to clip ads or pictures of people depicting their work role in the home - nursemaid, dietitian, food buyer, cook, dishwasher, housekeeper, laundress, seamstress, practical nurse, maintenance man, gardener, chauffeur).
6. Write a paragraph on three persons telling how their work role influences their family life. Ex: concert artist, factory worker, teacher.

II. The Extrinsic Value of a Homemaker If She Were Not A Member of the Family

A. Sample Learning and Evaluation Activities

1. Select six roles performed regularly by a homemaker-wage earner you know; and develop a list of the knowledges and skills needed to perform each role.
2. Play "Occupation Walk" (Reference: Game activity, "What's New in Home Economics," XXXVII March, 1973, p. 151. Substitute names of occupations of homemaker-wage earner.)
3. Read the chart from Changing Times, April, 1973, p. 12.
4. Using a worksheet based on this chart, have students compute the weekly, monthly, and yearly salary.

III. Simulate Activities of the Homemaker as a Laundress

A. Sample Learning and Evaluation Activities

1. View filmstrip, "Focus on Family Wash" and list steps for washing clothes. (Reference: Filmstrip and pamphlet, Proctor and Gamble).
2. Take a survey of types of soaps, detergents, and other laundry products used in homes of class members. Do a cost comparison.
3. Visit a laundromat and an automatic cleaning establishment.
4. Discuss factors to consider when using a dryer: time, temperature, removal.
5. Display and discuss ironing and pressing equipment.
6. View transparencies "Techniques for Pressing." (3M Company)
7. Demonstrate ironing and pressing basic techniques on garments such as: dress, blouse, skirt, shirt, and pants (brought from home).

IV. Simulate Activities of the Homemaker as a Seamstress

A. Sample Learning and Evaluation Activities

1. Check individual wardrobe for clothing needing to be repaired.
 - a. Make a list
 - b. Select one item and bring to repair in class
2. Assemble a sewing kit for making simple repairs.
3. Observe a demonstration of a correct method to make repairs.
 - a. length of thread
 - b. using double or single thread
 - c. threading a needle
 - d. knotting the thread correctly
 - e. steps involved in repairs mentioned
4. Earn sewing machine license.
 - a. thread machine
 - b. thread bobbin
 - c. back stitch
 - d. sew a straight seam
 - e. turn a square corner
 - f. sew a curve
5. Make a simple garment using the assembly-line approach (e.g. beach hat).

V. Simulate Activities of the Homemaker as a Housekeeper

A. Sample Learning and Evaluation Activities

1. View selected filmstrip and list home care responsibilities. (Filmstrip: Proctor and Gamble, Road to Responsibility)
2. View selected transparency and discuss items to consider in planning use of time. (Transparency: Scholastic School Service, Planning Your Time)
3. With teacher's help, develop outline to follow when doing a research project. Develop forms for recording results. In teams of two, use research method to study various ways to do one housekeeping job. After analyzing results, demonstrate best way to class and tell why it is best.
4. During each demonstration of the best method for doing a job, take polaroid pictures and use photos to make a bulletin board or posters on "Help Wanted At Home."
5. Watch a demonstration, then try: use of vacuum cleaner, how to dust, use of dusting aids, cleaners, and waxes.

VI. Simulate Activities of the Homemaker in the Role of a Nursemaid

A. Sample Learning and Evaluation Activities

1. Listen to and participate in discussion after a panel discussion on acceptable and unacceptable ways of getting along with children - using parents, nursery school teachers, and baby-sitters. Tape or videotape the discussion and use for reference during general discussion.
2. View filmstrips, "The Job - The Kids" and "Baby-Sitting" to find out the qualifications and responsibilities of a babysitter. (Filmstrips: Guidance Associates) "The Babysitter" (Filmstrip: Bell Telephone Co.)
3. Listen to a resource person - policeman, rescue squad member, fireman, etc., talk on handling emergency situations when baby-sitting.
4. Perform the following activity: Pretend a child is playing with your purse. Remove each item and tell if it might be dangerous and why.

5. View filmstrip, "Toys and Activities for Pre-School Children" and discuss ideas presented in classtoons, "Homemade Developmental Toys." (Filmstrip: J. C. Penney Company; Classtoons: #CT1500C Scholastic School Service, 904 Sylvan Avenue, Englewood Cliffs, New Jersey 07632.)
6. Construct a simple homemade toy or game.

VII. Simulate Activities of the Homemaker in the Role of Dietitian

A. Sample Learning and Evaluation Activities

1. Participate in a committee to study and prepare visuals for one of the following:
 - a. food groups
 - b. food sources
 - c. classification of nutrients, protein, fats, carbohydrates, minerals, and vitamins
2. Play the game Yummy Rummy to determine your understanding of food sources of nutrients. (American School Food Service Association, 4101 E. Liff, Denver, Colorado 80222 - \$1.25)
3. Prepare with the blender and serve several appropriate snacks from the milk food group. Analyze them for ease of preparation, taste and nutrition.

VIII. Simulate Activities for the Homemaker in the Role of Cook

A. Sample Learning and Evaluation Activities

1. Respond to a pre-test, "Can You Name This?" Give name and use of utensil or tool.
2. Participate in utensil hunt to learn where various pieces are kept.
3. View student demonstrations of the use and care of small equipment.
4. View demonstrations conducted by resource person on use and care of major appliances.
5. View selected filmstrip and list the safety conditions to observe in the kitchen.
6. Become familiar with abbreviations, measurements, and terms used in recipes.
7. View a demonstration on the correct method of measuring. Compare serving tablespoon with standard measuring spoon.
8. Study a recipe. Interpret directions, abbreviations and terms to a class partner.
9. Work in a small group. Plan and prepare a simple snack using a recipe.
 - (e.g. - a. cocoa to illustrate that milk cooking requires a low temperature.
 - b. milk shake to demonstrate that addition of air to a product increases quantity.)

IX. Simulate Activities of the Homemaker in the Role of a Practical Nurse

A. Sample Learning and Evaluation Activities

1. Prepare a display of first-aid supplies. Label each item. (Bulletin: First-Aid Manual, Garden City, New York)
2. Given index cards with common emergencies described, select the first-aid items needed from the display and describe how to use it.
3. Prepare a puppet show to present to fellow classmates or to lower grade classmates. Puppets can be made from construction paper, paper bags, or fabrics. Each puppet may represent some aspect of physical health. Ex: diet, sleep, exercise, etc. Each puppet may play a part that reveals the contributions it makes keeping physically healthy and how being healthy affects one's work.

4. Construction of improvised equipment (e.g. bed rest, disposable waste container).

X. Simulate Activities of the Homemaker in the Role of a Food Buyer

A. Sample Learning and Evaluation Activities

1. Visit several grocery stores to observe the method of displaying foods.
2. Make graphs of various foods showing seasonal variations.
3. Read and compare labels on packages and cans.
4. Compare prices of different forms of same food (ex: powdered milk, fresh milk).
5. Compare prices of different sizes of same food.

XI. Interpretation of Consumer and Homemaking and Occupational Homemaking Courses at the High School

A. Sample Learning and Evaluation Activities

1. Mini field trip for observing a class engaged in homemaking activities.
2. Resource person (e.g. an enthusiastic student share his or her concepts of the homemaking program).
3. View slides taken of activities on-going in homemaking and/or FHA.
4. View FHA scrapbook to become familiar with the organization.
5. Panel discussion on the benefits received from taking Consumer and Homemaking courses (parents, students, and administrators could be used for the panel).

HEALTH OCCUPATIONS CLUSTERS

Suggested Outline for Health Occupations in Occupational Exploration in the Middle Grades

I. Orientation

A. Sample Learning and Evaluation Activities for Health Information

1. Survey students' interests (this information will provide ideas for "hands-on" experiences, field trips, resource persons, etc.)
2. View film "Horizons Unlimited" or similar film.
3. View want ad section of newspaper for health ads and circle these with felt tip pen.
4. Make a collage (want ads may be used, advertisements of health products, pictures of health workers, pictures that depict the job description of workers).
5. Take a true/false test listing 100 or less statements relating to health care and treatment, such as: "Some aspirins are far superior to other aspirins;" "All radio and television advertising about what is good or bad for your health is good."
6. Select 15 misconceptions from introductory test on which to test their parents.

II. Medical Terminology

A. Sample Learning and Evaluation Activities for Medical Terminology

1. Play bingo game (may be used for identifying abbreviations, prefixes and suffixes).
2. Use flash cards to identify many of the health workers by their professional name rather than the lay name.

III. Prevention of Spreading Germs

A. Sample Learning Activities and Evaluation for the Prevention of the Spreading of Germs

1. Take pre-film test questions.
2. View film "Handwashing Procedure," or similar film and complete program.
3. Take post-film questions.
4. Practice correct procedures for hand washing.

IV. Measuring Body Heat

A. Sample Learning Activities and Evaluation for Measuring Body Heat

1. Complete programmed instruction on proper use of the thermometer, taking pulse and respiration. American Red Cross, Home Nursing Programmed Instruction.
2. Have qualified resource person demonstrate taking temperature, cleaning the thermometer, taking pulse and respiration.
3. Take temperature, clean the thermometer, take pulse and respiration.

V. Screening One's Health-Weight-Height-Vision

A. Sample Learning Activities and Evaluation for Screening One's Health

1. Review height and weight chart.
2. Demonstrate the procedure of weighing and measuring a patient using the health meter scales.
3. Weigh and measure a classmate.
4. Compare his weight and height with the weight and height chart.
5. Check classmates' eyes using the Snellen (E) Chart.

VI. The Role of the Dental Assistant, Dental Hygienist, and Dental Technician

A. Sample Learning Activities and Evaluation in the Dentist's Office

1. View loops or filmstrips on dental assistant, dental hygienist and dental technician.
2. Write a generalization for each (this should indicate their understanding of the role of each).
3. Simulate activities that would be typical of each (Ex.: dental hygienist - demonstrate how to use dental floss). "Fingers & Floss"
4. Complete "Take A Look At Your Teeth" (free from North Carolina State Board of Health, Dental Health Division).
5. Complete "Dental Puzzle" (free from North Carolina State Board of Health, Dental Health Division).

VII. Preparing a Patient's Unit for Admission

A. Sample Learning Activities and Evaluation for Preparing a Patient's Unit for Admission

1. Read or listen to the material on the importance of order cleanliness. (Basic Nursing Procedures)
2. Have an employee from the housekeeping department of the hospital demonstrate the procedure for cleaning a unit.
3. Clean the unit following the directions on "Cleaning A Unit."
4. Complete the programmed materials on putting a pillowcase on a pillow. (Reference: American Red Cross, Home Nursing Programmed Instruction.)
5. Make the closed bed. (Reference: Basic Nursing Procedures.)
6. Arrange the furniture as it would be arranged in a hospital room.

VIII. Who Am I?

A. Sample Learning Activities and Evaluation for "Who Am I?"

1. Read or listen to "Confusion in the Hospital."
2. Make badges representative of the workers in the health field.
3. Design and play a game, "To Tell the Truth." (Students' dress depicting as many different health occupations as possible; they can wear a camouflage over their dress until the true identity is established. When identified, they give a brief job description and may show tools that are representative of this job.)

IX. Interpretation of Health Occupations Courses at the High School

A. Sample Learning and Evaluation Activities

1. View filmstrip, "Debbie and Doug Search for Tomorrow." (This may be borrowed from Health Occupations teacher.)
2. Mini-field trip to observe students involved in health occupations activities.
3. Resource person (e.g. an enthusiastic student share his or her concepts of the health occupations program).

HOSPITALITY AND RECREATION CLUSTER

Suggested Outline for Hospitality and Recreation Occupations in Occupational Exploration in the Middle Grades.

I. Orientation

A. Sample Learning and Evaluation Activities

1. Use the dictionary to define terms "vocational" and "avocational."
List several activities for each.
2. List free time activities and interests, suggest possible career or job opportunities related to each.
3. Discuss illustrations from comics depicting situations involving hospitality and recreation.
4. Use want ads section of the paper to list or circle careers or job opportunities related to hospitality and recreation.
5. Interview a person who works in the field of hospitality and recreation.
6. Invite an enthusiastic resource person in hospitality and recreation to come interact with class members (ex: airline stewardess or steward).

II. Tourism

A. Sample Learning and Evaluation Activities

1. Completion of questionnaire, "What Do You Know About Your Community?"
2. Examine a North Carolina map, list an outstanding attraction of the State in each of the following categories:
 - a. historical
 - b. educational or cultural
 - c. entertaining for families
 - d. entertaining for older couples
 - e. scenic
 - f. unusual
4. Draw on state map a circle tour - one day, half-day, three days.
5. List main highways through your community and good stopping points within 25-50 miles.
6. Roleplay directing a stranger to several points of interest.
 - a. Use the words right, left, straight ahead. Avoid east, west, north and south.
 - b. Show on a map where the tourist is now and where he is going. If maps are not available, draw a sketch to illustrate your directions.
7. Fill in county names on an outline map of North Carolina.
8. Create devices for stimulating tourism to your town: (Ex.: Welcome signs; participation in "We're Glad You're Here" program.)

III. Food Services

A. Sample Learning and Evaluation Activities

1. Have local resource person discuss employment opportunities in the food service industry, pointing out requirements for training and experience for various positions.
2. Check newspaper want ads and list the type of employment opportunities available in the food service industry in your area.

3. Review the chart - "Jobs Available in the Food Service Industry."
(Resource: "Your Career in the Hotel-Motel Industry" - Free. The Educational Institute of the American Hotel and Motel Association, Kellogg Center, Michigan State University, East Lansing, Mich. 48823).
4. Take field trips to local eating establishments to observe tasks being done by workers.
5. Compare tasks observed to the chart - "Jobs Available in the Food Service Industry."
6. Eat at several eating establishments in order to become more familiar with the role of the guest or customer.
7. Take a field trip to food processing plant, wholesale grocery and/or bakery to look for occupations other than those in food service which use related knowledge and skills.
8. Interview an employer as to characteristics needed for individual's success in employment.
9. Use catalogs and exhibits to study desirable qualities to be found in appropriate clothing for the food service worker.
10. Invite a representative of the employment service to talk to the class about laws and regulations related specifically to food service work such as: age and health requirements, dress requirements, and health certificates.
11. View transparencies: "Sanitation in the Kitchen."
12. Experiment: empty pencil sharpener onto a paper towel. Put finger tips on pencil trimmings. Then set the table (one place setting). Observe how easily bacteria can be spread.

IV. Hotel and Motel

A. Sample Learning and Evaluation Activities:

1. Field trip to hotel and/or motels in the community to become aware of the job opportunities they afford.
2. Work along with employed personnel for a short period in order to observe the tasks to be performed.
3. Select an item from an exhibit of cleaning supplies and equipment used for motel rooms and prepare a short demonstration of its use.
4. View regulation policies to be followed when entering a hotel or motel room.
5. Perform some assigned cleaning tasks within the school such as cleaning carpet, bare floors, and glass doors.
6. Invite a resource person who travels a great deal to discuss what he expects in a well-kept room.
7. View the post cards of hotels and motels. List the exterior traits that would appeal to tourists.
8. Examine the post cards showing the interior of hotels and motels. List the things you see that would appeal to a guest.
9. Fill out the sample registration card for a motel room. Compare yours to the one which has been completed.

V. Sample Rationale and Behavioral Objectives for Designing a Learning Activity Package Which Encompasses Several Aspects of Hospitality and Recreation

- A. Rationale - Hospitality and recreation offer extensive opportunities now and in the future. People and communities find that they require assistance in planning activities, providing facilities, and acquiring new skills to enrich daily living. In the future, leisure in our society will abound even more, amplifying the need for trained recreators to cope with its challenges.

B. Behavioral Objectives

1. Upon completion of this unit, each participant will design an informal invitation of his choice which has the proper size, proportion, and design to fit the occasion. The teacher will determine whether the invitation meets the criteria.
2. Upon completion of this unit, each participant will write an informal invitation in ink that includes: type of activity, date, hour, location and R.S.V.P. The teacher will determine whether the written invitation meets the criteria.
3. Given a vase or a container, styrofoam, permanent flowers, and written rules of design, each participant upon completion of this unit will arrange a centerpiece. The ability of the student to successfully complete this objective will be determined by the teacher.
4. Given ribbon, diagram and written steps in tying a corsage bow, each participant upon completion of this unit will tie a corsage bow. The student will meet this objective to the satisfaction of the teacher.
5. Given a bow, permanent flower, and written steps on a poster, each participant will make a miniature corsage upon completion of this unit. The student will meet this objective to the satisfaction of the teacher.
6. Given at least 3 recreational ideas and a list of materials, each participant upon completion of this unit, will be able to identify (orally or in writing) and make those materials that are appropriate for one recreational idea. The student's ability to achieve this objective will be determined by the teacher.
7. Given the student-prepared materials, the participants upon completion of this unit, will demonstrate through role playing the selected recreational idea. The student's ability to achieve this objective will be determined by the teacher.
8. Given a list of facts about entertaining, menu planning, and recipes, each participant upon completion of this unit, will demonstrate in writing an appropriate menu for an informal occasion. The teacher will determine the student's ability to meet this objective.
9. Given a simple recipe and ingredients, each participant or group of participants upon completion of this unit will prepare an appropriate food or beverage. The student or students will meet this objective to the satisfaction of the teacher.
10. Given the student-planned menu, a chart on arrangement of table setting, plates, napkins and cups, each participant upon completion of this unit, will demonstrate the setting of a table. The teacher will determine the student's ability to achieve this objective.
11. Given occupational information, each participant upon completion of this unit, will demonstrate orally or in writing that he can list at least 5 different occupations related to the hospitality and recreation cluster. The student will meet this objective to the satisfaction of the teacher.

PERSONAL SERVICES

I. Orientation

A. Sample Learning and Evaluation Activities

1. Write your definition of the personal services cluster and compare it with the definition written by the teacher.
2. List at least 10 different occupations that would be classified as personal services occupations.
3. View want ads section of the newspaper or magazine to find the demand for the jobs you listed in Number 2. Circle these with a colored pen.
4. Use the want ads to demonstrate the qualities sought more frequently in various personnel.

II. Cosmetology

A. Sample Learning and Evaluation Activities

1. Go on a field trip to a school of cosmetology or a beauty shop to become familiar with the jobs performed by a cosmetologist.
2. Make a poster to show jobs that may be done by the cosmetologist other than wash, set, and comb hair.
3. Use "mystery box" technique for identifying tools of a cosmetologist.
4. View a filmstrip or loop on the cosmetologist.
5. Use resource materials to identify and list the qualities that a cosmetologist must possess in order to gain and maintain a steady clientele.
6. Choose from a list the correct definitions of terms (e.g. blow cut, manicure, frosting, facial, tint, pedicure).
7. Using the Occupational Outlook Handbook, describe the qualifications of a cosmetologist.
8. View the charts "Tools of a Manicurist" and "Steps in Giving a Manicure."
9. Give yourself or a classmate a manicure.
10. Practice rolling, combing, and brushing a wig.

*Similar activities may be done for simulating the occupation of a barber.

III. Simulate Short Order Restaurant

A. Sample Learning and Evaluation Activities

1. Demonstrate the possible sequence of jobs for a cook (e.g. kitchen helper through head chef) through role play, art, or other related activities.
2. View filmstrip and listen to tape, "The Waitress" by Eyegate Company.
3. Describe the Board of Health requirements for waiters and waitresses.
4. Plan for and go on a field trip to a short order restaurant to become familiar with the duties performed by different workers.
5. Discuss check sheet used by sanitarian.

6. Simulate the responsibilities of the waiter or waitress, busboy, chef or cook, cashier, manager, sanitarian and customers in an improvised short order restaurant setting.
7. Identify places where one may be trained as a chef or cook.

*Naming restaurant and adding appropriate props creates a more realistic situation and interest.

**Simulation of a bakery may be done similarly to the short-order restaurant.

IV. Dry Cleaner or Laundry Worker

A. Sample Learning and Evaluation Activities

1. Visit a laundromat and an automatic cleaning establishment; also visit a conventional laundry and dry cleaner's establishment.
2. Contrast the services and cost of these services observed on the two field trips.
3. View a poster or chart showing commercial equipment used in a laundry or dry cleaner's. Identify the workers who use specific equipment.
4. Practice using the iron at various temperatures on samples of various types of materials. Summarize the relationship between temperature and type of material.
5. Given the necessary supplies and charts, practice techniques of removing one or two stains on samples of fabric. (Reference: Bulletin: U. S. Department of Agriculture, Stain Removal From Fabrics.)
6. Invite a linen service routeman to share with the class his job responsibilities.

APPENDIX F

OCCUPATIONAL INFORMATION CENTER

Occupational Information Center

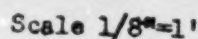
The Occupational Information and Student Self-Appraisal Center is a vital part of any effective exploration program.

Activities in this laboratory should provide students the opportunity to engage in learning experiences related to self-appraisal and information about the world of work. Occupational information and self-appraisal should be closely connected to the carefully planned experiences in the other laboratories, so as to provide students immediate follow-up and reinforcement to these learning experiences.

Provisions should be made for students in all laboratory areas to have access to the occupational information center at least once each week. This will enable them to study about job opportunities related to laboratory activities during the time they are engaged in "hands-on" experiences.

APPENDIX F

The following pages give some suggestions for facility layout, equipment, and teaching materials, along with some student activities. A word of caution is given, however, concerning teaching materials. ^{OCCUPATIONAL INFORMATION CENTER} There is an ever growing amount of occupational information on the market today, some of which is of questionable value; therefore, it is strongly recommended that any material purchased be carefully reviewed by the teachers who will use the material. Only those materials that fill a particular need for the students in your school/s and which are in line with the occupational exploration concept should be secured.



LEGEND

- A. = storage cabinet 3'x4'x7'
- B. = storage shelf
1' width x 12' length
- C. = storage cabinets 2' x 12'
- D. = chalkboard/bulletin board*
- E. = easy chair 3' x 3'
- F. = table 2' x 2'
- G. = lounging pillows 18" diameter*
- H. = area rug 9' x 12'*
- I. = study carrels 3' x 3'
- J. = portable filmstrip screen
- K. = round table 3' diameter
- L. = round table 4' diameter
- M. = student desk 18" x 3'*
- N. = teacher desk 3' x 2' *
- O. = filing cabinet 2' x 18"
- P. = magazine rack 2' x 1'
- Q. = portable partition*

AREAS:

1. Listening area
2. Conference-office area
3. Discussion area
4. Browsing area
5. Individual study area

*Items to be provided by local unit

List of Suggested Equipment

filmstrip projector
film loop projector
record player
player-recorder
large screen
video tape equipment
silent viewer studymate
portable screen (easel type)
A-V Table
independent study auto vance
previewer
head sets
slide projector
cassette recorder
movie projector
filmstrip viewers
filmstrip cabinet
paper cutter
duplicator
typing tables (4-5)
teacher's desk*
aide's desk*
6 position carrel with dual AC power outlets
steel card cabinet
charging tray
all purpose tables (round and rectangular)
sections of magazine shelving
four drawer filmstrip storage cabinet
listening centers for use with headphones
stacking chairs
cassette players
bean chairs*
reading lamps*
bookcase
area rug*
display board
magazine rack

*Items to be provided by local units

List of Suggested Resource Materials: (filmstrips)

Eye Gate House

Are You Looking Ahead?
Do You Like Flowers?
Do You Love Animals?
Do You Like Sports?
How About Being An Electronics Assembler?
Would You Like To Be A Cashier?
Looking At Business Careers
Want To Work In A Laundry?
Would You Like Hospital Work?
How About Office Work?
How About Being A Key Punch Operator?
Face Facts
What Is Economics?
The ABC's Of Getting And Keeping A Job
Preparing For The Job You Want
Applying For The Job You Want
On The Job
Budgeting Your Money
Labor Unions
Health Rules To Follow
Face Facts
Quizstrip

Guidance Associates

If You're Not Going To College
Jobs and Gender
Job Attitudes: A Job That Goes Somewhere
Job Attitudes: Liking Your Job and Your Life
Job Attitudes: Why Work At All
High School Course Selection And Your Career
Choosing Your Career
Preparing For The World of Work
An Overview of Technical Education
Babysitting
Your Future in Elementary Education
A New Look At Home Economics Careers
On the Job: Four Trainees

Resource Materials - filmstrips (cont.)

Guidance Associates

Career Discovery Series (Filmstrip-Record Set)
What You Should Know Before You Go To Work
Our Money System
A New Horizon: Careers in School Food Services
Preparing For Jobs Of the 1970's
Your First Year In High School
Job Attitudes: Trouble At Work
Four Who Quit
Dropping Out: Road to Nowhere

Vocational Education Productions

Careers In Ornamental Horticulture
Careers In Government Services
Careers In Farm Services
Careers In Farm Supplies
Careers In Natural Resources Management
Careers In Farm Machinery Sales and Service

Singer - SVE

Listening and Reading Skills
Job Opportunities Now
Preparing To Study
What Are Job Families?
Who Are You?
How To Take A Test
Why Study?
What Is A Job?
What Do You Like To Do?
What To Ask, How and Where to Find the Answers

Educational Projections Corporation

Finding Work: How One Goes About It, What to Expect
Looking For A Job
Filling Out An Application
Selecting A Job
The Interview
Filling Out A Medical Record
Using the Want Ads
Answering The Want Ads

Money Management Filmstrip Library

Be Credit Wise
Your Wardrobe and You
Your Money and You
Spending Your Food Dollars

Resource Materials - kits (cont.)

KITS:

SRA

Worth Waiting For
Work Widening Occupational Roles
Job Experience Kit

Sextant Systems, Inc.

Junior Sextant Series Kit

Careers Inc.

Careers Kit

BOOKLETS:

SRA

Job Family Series
Junior Guidance Series
What Job For Me
Senior Guidance Series
 You And Your Abilities
 Discovering Your Real Interests
 Understanding Our Economy

BOOKS:

SRA

Handbook of Job Facts
Directory of Vocational Training Sources
Occupational Information

McGraw Hill

Your Job and Your Future
Occupations and Careers

Dillion Press

Looking Forward to a Career

Interstate Printers & Publishers Co.

Career Choice and Career Preparation

McKnight and McKnight

Succeeding in The World of Work

Resource Materials-books (cont.)

G and C Merriam Co.

Webster's 7th New Collegiate Dictionary

U. S. Department of Labor

Dictionary of Occupational Titles (classification)

Dictionary of Occupational Titles (definition)

Occupational Outlook Handbook

GAMES:

Managing Your Money

Careers

Steady Job

Suggested Activities:

1. Describe yourself in pictorial form.
2. Make a booklet on yourself.
3. Discuss ways people differ.
4. Write an autobiography.
5. Complete "sentence stems."
6. Construct a mobile.
7. Discuss good study habits.
8. Plan a weekend vacation.
9. Read the stock market report.
10. Take a personality test.
11. Respond to pictures of people - guess what they are like.
12. Explore the want ads.
13. Take an interest inventory test.
14. Demonstrate one ability you have.
15. Give an interest inventory, form the profile and analyze the results.
16. Allow students to observe people at work: (1) occupations at school, (2) field trips to local industry.
17. Discuss the different types of abilities.
18. Have students do a perception test and form profile.
19. Role play a job interview.
20. Have students list five occupations related to each interest category.
21. Have students list activities they like to do.
22. Use job experience kits.
23. List 10 likes and dislikes about people.
24. Check height and weight of classmates. Discuss how physical characteristics are related to occupational opportunities.
25. Tape the voice of students. Discuss how voice and voice habits relate to different occupations.
26. Plan a weekend vacation.
27. Without a field trip brainstorm: (1) to identify as many jobs as possible in a local supermarket, discount store, etc., (2) identify occupations within each cluster.
28. Discuss program within community college or technical institute catalog.
29. Make a new friend within the class. Find out: (a) likes and dislikes (movies, games, habits, styles, etc.), (b) areas of excellence (sports, dancing, hobbies, etc.), (c) etc.
30. Role play an employment agency.
31. Have students write an "Ann Landers" type letter about any problem. (Do not sign.) Counselor should follow-up problem expressed in letters.
32. Roleplaying (parents, teachers, principal, employees, peers).
33. Play charades (occupational).
34. Research your favorite job.
35. Use ample resource personnel: (1) to change pace - avoid boredom, (2) to provide occupational information in their field.
36. Complete an occupational puzzle.
37. Take a trip to community college or technical institute.
38. Make an assignment pad - explore the job of bookbinding.
39. Use pegboard to test speed and finger dexterity.
40. Discuss the different interest categories.
41. Take a trip to the local high school.
42. Provide ample multi-media materials and equipment and schedule time for students to: (1) learn to operate, (2) use as source of occupational information, (3) further pursue areas of high interest.

APPENDIX G

GENERAL INFORMATION

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METHODS OF INSTRUCTION

In Developing Individualized Instruction Materials by Johnson & Johnson, readers are advised of the principal methods by which instruction is provided. The following listing is merely topical. It is recommended that since full descriptions of each method may be desired, teachers may wish to make reference to the original material developed by Johnson & Johnson.

- . Comparative Analysis
- . Conference
- . Demonstration
- . Diagnosis
- . Directed Observation
- . Discussion
- . Drill
- . Experimentation
- . Field Experience
- . Field Trip
- . Group Work
- . Laboratory Experience
- . Lecture
- . Manipulative & Tactile Activity
- . Modeling & Imitation
- . Problem-solving
- . Programmed Instruction
- . Project
- . Reading
- . Recitation
- . Role-play
- . Seminar
- . Sensitivity Training
- . Shopwork
- . Skill Practice Session

LEARNING IS AN INDIVIDUAL ACTIVITY

In a recent article by Rita and Kenneth Dunn entitled, "Kids Must Learn How to Learn Alone," many significant points are made that would contribute to a more effective instructional program in our schools. The authors suggest that for years educators have been developing systems of instruction designed to effectively teach most students. Each educator developing a new method becomes so enthusiastic about the new approach that they tend to treat it as a panacea.

It is now apparent that children learn through uniquely different patterns; thus, one method should never be used exclusively. Ideally, a wide range of alternatives should be provided that allow youngsters to learn individually according to the student's own learning style.

It is unfortunate that most American children are not prepared for an individualized learning approach. From birth most children are conditioned to accept direction from others. In the home they continue to be directed toward forms of acceptable behavior, dress, social interaction, speech and play. In school they quickly learn that they must adhere to the rules and regulations under which that school operates; thus, during most of their early years their lives are directed in such fashion as when and how to awake, eat, dress, leave home, arrive elsewhere, play, work, study, return home and sleep. After from 5 to 15 years of structured, submissive and directed behavior, it is unreal to expect children to function effectively in an individualized program that requires problem-solving ability, decision-making and individual self-organization. In fact, some children become disoriented when thrust from a total structured environment into such a setting. If individualized instruction is to be successful with these students, it is imperative that the process be gradual thus providing more independence as students indicate a capacity to select appropriate options and learn independently. Students can't be expected to make an intelligent self-instructional decision without first being taught how. Assisting students through the processes of selecting, locating, decision-making, cooperating and evaluating demand varying amounts of teachers' and students' time, energy and competence. Teachers and administrators must be effectively trained in these operations if each student is to succeed.

Learning in small groups is an important first step in the transition from traditional education to the individualized teaching-learning process. Techniques such as circles of knowledge, team learning, case history, brain-storming and simulation are effective in the early stages. It also provides opportunities for small group interaction and group decision making to allay fear of failure or embarrassment. Typically, when errors are made, the responsibility is shared with the peer group which sharply reduces individual attention or trauma. In addition, peer interaction creates a sounding board suitable for comparing of ideas, reaching conclusions and suggesting solutions or decisions to the group and teacher.

Establishing instruction areas or centers is a good second step in the process of individualizing instruction. After students have exhibited the ability to learn effectively in small groups, they should be ready to begin working independently or with partners in defined learning areas. Such instructional areas should be established to provide a variety such as interest centers, game tables, little theaters and media corners, etc. Multi-instructional areas within the classroom encourages students to carefully examine their objectives to determine resources through which they may achieve these objectives and seek means for evaluating personal progress.

As students start utilizing the varied instructional areas, they must be taught to locate and use resources and information available to them, make notes of what they should remember, identify ways of demonstrating learned skills and evaluate and appraise their own progress. It is important that each of these instructional areas offer many opportunities that require students to make choices as he progresses and evaluate selections he has made. It is important that teachers remember that not all students exhibit identical readiness for each phase of instruction at the same time; thus, when a student needs to use a catalog, he should be taught how, and when a filmstrip is torn, he should be taught how to repair it.

It is important to build self-reliance in youngsters as soon as they show readiness. The teacher should avoid teaching the same task repeatedly, but should train 2 or 3 learners at one time who can then serve as peer instructors. This process serves as a reinforcement for the "peer instructor."

Shortly after the teacher begins to use the process of individualized instruction, she should refine her diagnostic skills. This calls for careful student observation, recording of student's strengths, interests, and varied learning styles. Such observations and information should be the basis of the prescription that is developed for each pupil. The teacher should also assess available resources including personnel and identify ways to utilize them in the instructional program.

A teacher who is just embarking into the individualization process should limit her efforts to one curriculum area - normally that area which she likes most or personally feels most proficient. This area should be analyzed to determine precisely what is important for each student to learn, hold high degree of student interest or special significance for specific students and special enrichment studies which could be made optional for individual class members. These curriculum concepts, facts or skills should then be identified as behavioral or performance objectives so that each student knows exactly what he is expected to learn, the degree of proficiency to be expected, and how this achievement may be demonstrated. Teachers should design their instructional program to include a maximum of multi-sensory activities thus eliminating to the greatest extent possible boredom which might result from information presented and learning activities provided in the "same old way."

The designing of prescriptions for students is the normal procedure following student diagnosis and the development of behavioral or performance objectives. In the beginning the students' prescriptions should be relatively simple and as high in interest as possible. The early prescription may require considerable teacher guidance through some of the various stages. As students develop skill in following prescribed instructions, the prescriptions should be adjusted to assist the students in becoming relatively independent learners. Options should still allow students to work as individuals, with a friend, or in small groups.

While working on individualized instruction, students will need to learn how to: (1) utilize their time and efforts wisely and efficiently; (2) work with others to achieve certain objectives; (3) evaluate personal progress; (4) make notes of items not easily committed to memory; and (5) use pre-testing techniques to assist them in determining how much of what they are required to know remains to be learned. Students should learn how, when, and from whom to obtain assistance and that it is occasionally important to wait patiently until such help can be provided.

Of course, ideally, students will progress along the individualization continuum, gradually becoming confident and competent in this process. Ultimately, he should be able to evaluate his growth in terms of desired objectives without much assistance from

the teacher. Finally, he may be able to design his own prescriptions which will include clearly stated objectives, alternative resources, reporting and activity options, personal assessment instrument and a final assessment reached through written, oral or performance means. This level of performance may be reached quickly by a few, within a reasonable amount of time by many, and possibly never by some students.

As the student exhibits more independence and his ability to teach himself increases, he may well become totally independent of the necessity for the prescription structure. When this occurs, he should be encouraged to construct the learning program that is uniquely his own. Since, as mentioned before, peer instruction is a reinforcing tool and probably one of the best ways to learn, this student will undoubtedly become the teaching assistant for peers as well as himself. At this point the student will have achieved mastery of total individualization of the teaching-learning process.

LEARNING PRINCIPLES*

No. 1: READINESS

Learning is governed by the readiness of the learner.

No. 2: MOTIVATION

Intent to learn is necessary for purposeful learning.

No. 3: PERCEPTION

A person tends to believe according to how he perceives a situation.

No. 4: GOALS

Goals must be clearly in mind and accepted by the learner if adequate learning is to take place.

No. 5: INDIVIDUAL DIFFERENCES

Learning varies with the individual.

No. 6: TRANSFER AND RETENTION

Learning is useful when a person can retain and apply it to new situations.

No. 7: COGNITIVE LEARNING

Cognitive learning involves recognition and/or discovery.

No. 8: AFFECTIVE LEARNING

An individual's affective learning determines how he relates himself to new experiences.

No. 9: PSYCHOMOTOR LEARNING

An individual's psychomotor learning determines how he is able to control his muscular activity.

No. 10: EVALUATION

The kind, the extent and the validity of evaluation affect present and subsequent learnings.

LEARNING PRINCIPLES

1. Readiness

Readiness is a condition of the individual which makes it possible to learn. There are varying degrees of readiness for learning a particular task. If the learner is not ready for a given task, he learns incompletely, is frustrated, may be blocked, or has other problems. Readiness includes physical growth and maturation, intelligence, background of experiences, previous learning, motivation, perception, and probably other factors which make learning possible.

1. Individuals learn best if the tasks are closely related to their abilities, interests, and backgrounds.
2. Readiness for learning must be assessed, not assumed. This means, for example, that the teacher might administer a readiness test or observe carefully the behavior of students as she teaches at their presumed level of readiness.
3. When individuals lack readiness for a task, the task should be postponed until readiness can be developed or the task can be restructured to fit the learner.
4. Readiness for learning reflects differences in kind as well as in degree. For example, two individuals with the same I. Q. might have different patterns of mental abilities.
5. Materials, activities, and tasks must be varied according to the readiness factors (cognitive, psychomotor, and affective) of the various learner.

2. Motivation

Motivation is a state of the learner which initiates activity, governs its direction, and fosters perseverance. Young children are naturally curious and engage in exploratory activities in the world in which they live. This curiosity ought to be encouraged rather than inhibited by insistence on a prescribed formula of educational sequence taught to all learners in the same way at the same time.

1. Not only is the individual motivated by the need to satisfy various deficiencies - biological, social or emotional - but in addition he can be motivated to enhance himself beyond his present standing.
2. Knowledge of progress toward a goal encourages continued effort. Experiences of failure which do not mar the learner's self-image can enhance his ability to persevere in learning situations.
3. Motives governing behavior are not always clear - even to the learner. For example, the individual who seeks out particular help from a teacher may be moved more by a need for affection than a desire to achieve.
4. Motivation is influenced by personality variables, such as feelings of inferiority, hostility, or self-confidence. Over- and under- achievers may have personality problems.
5. Security and success in goal achievement tend to increase motivation to learn. Failure may produce either increased or decreased motivation, depending on other factors. Not everyone is motivated by the same thing or to do the same thing.
6. Motivation increases if the learner has reason to believe that some of his needs will be satisfied.
7. Praise and reproof from teachers, parents and peers significantly influence motivation and behavior. The effects of praise are positive, but the effects

of reproof are less predictable. Thus, reproof may motivate or discourage a behavior with which it is associated.

8. Incentives and material rewards may sometimes be of value in classroom situations. There is danger that the individual will work for the reward rather than learning per se.
9. Competition and incentive may be effective in motivating, but where chances of success are perceived as only slight, competition may discourage motivation towards the goal in question. When the learner can predict success all of the time, his degree of maturation is reduced.
10. A favorable attitude toward learning is acquired by most individuals in the course of sustained, satisfying learning experiences.
11. Where learning and activity can be related to the existing interest of the learner, motivation is increased.

3. Perception

Perception is the interpretation of a life situation. Each individual perceives the world differently, and these perceptions affect behavior. A teacher may acquire a better understanding of a student's behavior if he is sensitive to how the pupil perceives a given situation.

1. Each learner senses the world differently from other learners because each learner has a different environment. All learners do not view the same environment in the same way.
2. The learner interprets his environment according to his own goals, attitudes, motives, past experiences, health, emotional state and abilities.
3. The ways one perceives himself are fundamental to his behavior. In a situation, the learner tends to act according to the way he perceives himself.
4. The learner can be helped by providing opportunities for him to evaluate his own perceptions. The teacher can be a referent of reality. Desirable behavior is dependent upon an accurate and realistic perception of a given situation. The teacher and others can help the learner evaluate his own perception.
5. Perception can be furthered by supplying to the learners views of what may be perceived.
6. The accuracy of perception must be frequently checked. Group discussions of problems offer opportunities for individuals to clarify their own perceptions.
7. Stages of growth and development of the learner will influence his view of himself.

4. Goals

A goal is the specific objective which one is attempting to obtain. This is different than purpose which may have a number of goals.

1. Goals should be commensurate with the abilities of the individual to attain them.
2. Societal demands and the individual's needs must be considered when establishing goals.
3. The learner will accept a goal if he feels that his needs will be met by the task he undertakes.
4. The purposes of the teacher and learner should be closely related.

5. Standards set by the various social groups of which one is a member and standards set by peers and authority figures may influence goal-setting behavior by an individual. Pressures to conform to standards tend to produce rigid behavior and inhibit creativity. The over-achiever often adopts compulsive and rigid behavior.
6. The degree of active involvement of the learner influences his goal-setting behavior. The extent of the learner's commitment influences his achievement.
7. The learner's feeling about his worth and his ability affect his goal-setting behavior. If failure to attain the goal threatens the self-concept, the person may raise his sights for social prestige or lower them to avoid failure.
8. The goals to be sought in satisfying needs frequently must be shown the learner. Various goals could satisfy a given need and various needs can be satisfied by given goals. The teacher's ability to help students formulate clear and appropriate goals becomes very important.

5. Individual Differences

Teaching must take account of individual differences in learners if all students in a class are to achieve maximum learning. Differences become more marked as students grow older. Teaching only one level fails to be effective for all pupils. One needs to understand the backgrounds, emotions, motives and abilities of each learner and adapt the learning materials and tasks accordingly.

1. The learner should be helped to understand his assets and limitations and to expect differences in tasks, activities, and accomplishments.
2. The learner needs to recognize his potentials and should be helped to plan and carry out his own activities.
3. The learner tends to select from an experience that which is consistent with his past experiences and which he feels will have meaning for him. A learner responds differently from other learners to a common experience because of his perception of that experience.
4. The learner needs a wide variety of tasks, materials, and methods consistent with his goals, interests and background.
5. Opportunities for learning are enhanced when an individual is not threatened by his environment, thus feels free to engage in learning activities. When a learner has freedom to think and act as an individual, problem solving, motivation and creative efforts are increased.
6. The learner who is encouraged to develop his own strengths learns more and shows eagerness to learn. If his weaknesses are stressed, he shows dissatisfaction for learning.

6. Transfer and Retention

When whatever is learned in one situation is used in a new or different situation, transfer of learning occurs. Retention is the ability to use again. Materials learned and retained can be used by the learner for application to new situations.

1. Intent to learn and remember fosters retention. Active attempts to recall or recite material to be learned improve retention.
2. Material that is meaningful to the learner is retained best.
3. Retention is affected by the setting (psychological and physical) in which the learning was acquired. Practice should be in a realistic setting.
4. Distributed practice (drill) favors retention. However, some important learnings are acquired which may need very little drill. Learning sessions which are distributed or broken into smaller units of time produce learning.

which is better retained than learning in longer sessions. The length of a learning or practice session may sometimes be determined by the internal logic or structure of the material to be learned and by the perceived need of the learner.

5. Review of factual material, skills, or concepts increases retention and transfer value. (If too much review is needed, the original materials may have lacked significance to the learner.)
6. Learning tends to occur when the activities lead to satisfying consequences.
7. Personal attitudes, feeling or emotional states of the learner lead to "selective forgetting." Thus, disagreeable materials may not be as well retained as material which the learner finds pleasant.
8. Interference in learning may occur when new but similar initial learning is increased when a new but similar learning is required.
9. Knowledge of concepts, principles, and generalizations will be retained better and will transfer more effectively than knowledge of facts and terminology. Transfer is furthered by relating applications for principles learned and by illustrating similar elements.
10. Transfer of learning to new situations is facilitated (not guaranteed) when useful relationships in unique, but somewhat similar, situations are determined.
11. The final phases of learning should include efforts to draw generalizations. These, in turn, assist in retention and transfer.

7. Cognitive Learning

Cognitive learning includes rote association, concept formation, problem-finding and problem-solving skills, from which new modes of behavior are formed. Thinking, reasoning, evaluating, and imagining are mental acts related to cognitive learning. The learning occurs at levels of complexity and requires various mental activities.

1. Attention must be focused on relevant aspects of the environment before cognitive learning can take place. The learner needs to direct his attention properly if cognitive learning is to occur.
2. The outcomes of cognitive learning will vary depending upon the levels and kinds of individual differences of learners.
3. Forms of readiness - vocabulary, reading ability, mental ability, and experiences directly affect cognitive learning.
4. Learning experiences must be organized into appropriate units.
5. When presenting concepts, meaningfulness is essential. Searching behavior, application, formal definition, and evaluation are needed to make sure that concepts are meaningful.
6. In problem solving, the learner must be aided to define and limit the problem, to find necessary information, to interpret and analyze this problem, and be permitted divergent thinking.
7. Attention to mental processes, rather than to cognitive and affective outcomes, favors problem solving, analysis, synthesis and reasoning.

8. Affective Learning

Affective learning includes values, emotions, motives, interests and attitudes. The learner may not be consciously aware of some affective learnings. Affective learnings include the original bases for, and the present forms of, the individual's values, emotions, motives, interests and attitudes.

1. Most life situations have an affective aspect.

2. How a learner adjust and reacts to situations will have an impact upon and will influence his affective learnings.
3. At times, important values acquired during the childhood years remain relatively undifferentiated throughout life. Undifferentiated values, attitudes and feelings may arrest his overall development.
4. Attitudes and values are frequently acquired through identification with other individuals rather than by direct teaching.
5. Attitudes are modified more easily as the result of pleasing experience.
6. A learner's values are influenced by a group's standards of behavior.
7. School learning and mental health are related. Students in good mental health tend to learn more readily than those with problems.
8. Affective learnings may be developed or modified through interaction between the teacher and the class.
9. The learner may be assisted to maturity by helping him to recognize and understand his attitudes, feelings, and emotions. Respect for the learner's attitudes, feelings, and frustrations is necessary to help him gain self-understanding and maturity.

9. Psychomotor Learning

Psychomotor learning has both mental and physical aspects.

1. In any given task a group will have wide variation in basic psychomotor abilities.
2. The psychomotor development of a given learner occurs unevenly.
3. An individual's skeletal-muscular structure and nervous system help determine his level of psychomotor performance.
4. Through play and informal activities the learner gains increasing control of his movements.
5. With physical and mental maturity, the learner's ability to integrate and refine movements is enhanced.
6. Environmental factors affect the type and extent of the psychomotor performance of the individual.
7. A well-conceived explanation, demonstration, and active participation by the learner increase the efficiency of psychomotor learning.
8. Appropriate practice, spaced at given intervals, enhances psychomotor learning. Meaningful practice should include a complete sequence of the motor act. Spacing cannot be done purely on a timed basis.
9. Excessive practice may result in fatigue which often results in a lower level of performance.
10. Psychomotor tasks too difficult for the learner may result in frustration and early fatigue.

10. Evaluation

The practice of evaluation makes it possible for an individual to assess progress toward previously identified goals. An individual's evaluation of his learning is influenced by his freedom to evaluate. Evaluation includes an awareness on the part of an individual of his level of performance, motivations for learning, and readiness to learn. The learner, interacting with other human beings in assessing his learning experiences, may improve his ability to evaluate experiences. Objective evaluation of one's own experiences is difficult. The knowledge is brought to, and insights are gained about an experience when the learner shares with interested informed persons.

1. Evaluation gives meaning to learning and provides new direction to the learning.

2. When goals and evaluation are seen in relationship, the evaluation becomes more meaningful to the learner.
3. Teacher evaluation practices influence what the learner engages in and learns.
4. Evaluation of progress toward a goal is enhanced when the teacher and the learner exchange and accept each other's thoughts, feelings, and observations.
5. Lack of, or incomplete evaluation reduces the teacher's ability to serve the learner. Conversely, comprehensive evaluations enhance the learner's abilities to do self-evaluation.
6. When persistent emphasis is placed upon the teacher's evaluation of the learner's performance, patterns of dependency, withdrawal and hostility may develop.
7. The peer group can be useful in evaluation.

*Total content from Teacher's Handbook prepared and distributed by State Superintendent of Schools, Madison, Wisconsin.

"INTERPRETATION OF INDIVIDUALIZED INSTRUCTION"

"Individualized Instruction," Mildred McQueen
SRA Research Report
The Education Digest, pg. 25-28, April, 1971

Ideal school program = one in which the student moves along at his own pace of learning in a curriculum designed to meet his needs. This is also known as individualized instruction.

Basic to an individualized learning approach is the role of the teacher to:

- a. motivate pupils
- b. make students curious about learning by creating an atmosphere that makes them want to try something different.

This may be partly achieved through:

- . maintaining warm relationships with student
- . seeking new ways to make learning exciting
- . providing guided selection of activities by students
- . listing the skills the student is to develop
- . analyzing student characteristics in selecting objectives, sequence of study and materials and methods.
- . reinforcing positive behaviors rather than punishing negative ones
- . using objectives stated in behavioral terms
- . providing multiple activities
- . determining time for study of a concept on the basis of student performance
- . evaluating students on basis of objectives selected rather than against other students - extensive use of pre- and post- tests and self-tests

Planning Student Learning Experiences

In designing learning experiences for students, it is very important to remember several criteria. They are as follows:

1. Plan a variety of experiences whereby students learn through reading, writing, seeing, listening, doing, and communicating with others.
2. Make sure the activities follow the criteria outlined in a previously developed objective.
3. Allow "sufficient time" for students to complete the activity and attain the level of competence required in the objective.
4. Develop clear and concise instructions as to what the student will do.
5. Make the learning conditions as related as possible to the conditions in which the task will be performed later.
6. Develop a logical sequence.
7. Make certain that all materials, equipment, and supplies necessary for the learning experience are provided.

Some suggested component parts of a lesson may include:

1. Rationale
2. Overall objective
3. Specific objectives
4. Pre-test
5. Description of learning experience (instructions)
6. Post-test
7. Evaluation
8. Bibliography (materials, equipment, and supplies)

TRADITIONAL TEACHING VERSUS INDIVIDUALIZED TEACHING*

The following dialogue is designed to show differences in the organization of an imaginary classroom situation in which "traditional-teaching" versus "individualized teaching" is being taught. The intent is to show the worse features of the traditional situation and the optimum features of the individualized situation.

TRADITIONAL TEACHING (average variety)

I sit (or stand) at the head of the class.

All thirty of my students are lined up in desks facing me.

I conduct the class. I tell the students what to do and when to do it.

I talk a good deal of the time. One of my favorite expressions is "pay attention, please."

All of my classes study the same units at the same time.

They all use the same textbooks, do the same assignments, and take the same tests.

INDIVIDUALIZED TEACHING (ideal variety)

There is not a front or back to the class. I have a desk in one corner where I sometimes talk with individual students. Most of the time I move about observing and helping individual students.

Students are scattered all over the room, busy at many different activities. Several students are out of the room working at resource centers and laboratories in the school building.

I work most of the time with individual students or small groups. The students themselves decide what to do and when to do it.

I talk very little, but the children talk a great deal, in pairs and in groups. My favorite expression is "lets see if you can figure it out."

My students set their own schedules, select behavioral objectives, and progress at their own rate of learning with my guidance. No more than a few students are likely to be doing the same thing in any unit of instruction.

Each student chooses his own instructional materials from the classroom resource center and school media center. There are no total class assignments. Tests are primarily to diagnose a student's achievement and/or problems so that he can be helped to learn better.

Many students dislike school.

For me, teaching at its best is a rather dull job; at its worst, it is an exhausting job of disciplining children who just aren't interested and won't pay any attention.

Most students find school exciting.

I find teaching a delightful way to make a living--no papers to grade (children correct their own mistakes). Discipline is not a problem because each child does what he wishes and is able to do it in an atmosphere of freedom, acceptance, and approval.

*Original source unknown; information has been modified.